Schneider AUDIO

Serviceanweisung
Service manual

Ident-Nr. 49958

SPP 93

Diese Service-Unterlage wurde ausschließlich für autorisiertes Fachpersonal erstellt.
Für Eingriffe durch nicht autorisierte Personen übernimmt SCHNEIDER keine Haftung.

This service manual was only made for authorized specialists.
For interventions by not authorized persons SCHNEIDER don't take possession of liability.

WICHTIGER HINWEIS/IMPORTANT NOTE

Der integrierte CD-Spieler arbeitet mit unsichtbarem Laserlicht.

Nicht in den Strahl blicken und sich nicht dem Strahl aussetzen!

Vorsicht, Laserstrahlung im Inneren des Gerätes!

Zur Vermeidung von Strahlungsschäden darf das Gehäuse nur von qualifiziertem Fachpersonal geöffnet werden.

Informationsetikett auf der Geräterückseite (siehe Bild).

The integrated CD-Player works with invisible laser-light.

Do not look into this beam and don't abandon yourself to radiation.

Attention, laser-radiation also inside of the unit!

To avoid damages of radiation unit should be opened only by qualified service personnel.

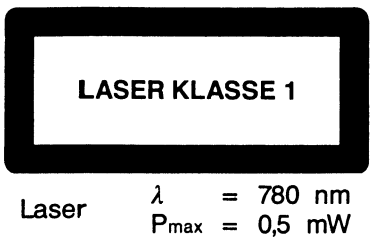
Information label on the rear of unit (see picture).

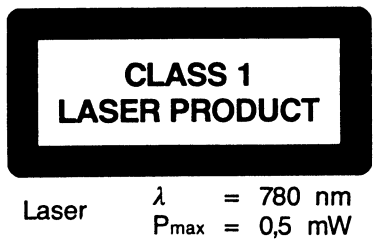
VAROITUS!

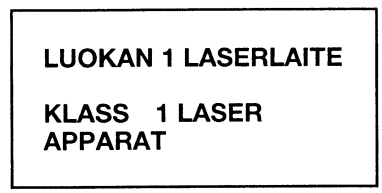
Suojakoteloa ei saa avata. Laite sisältää laserdiodin, joda lähettää näkymäntöntä silmille vaarallista lasersäteilyä.

VARO!

Avattaessa ja suojalukitus ohitettaessa olet alttiina näkymättömälle lasersäteilylle. Älä katso säteeseen.

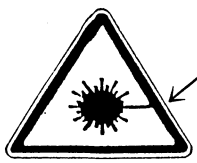






Warnetikett in dem Plattenfach (siehe Bild).

Warning label in record-drawer (see picture).

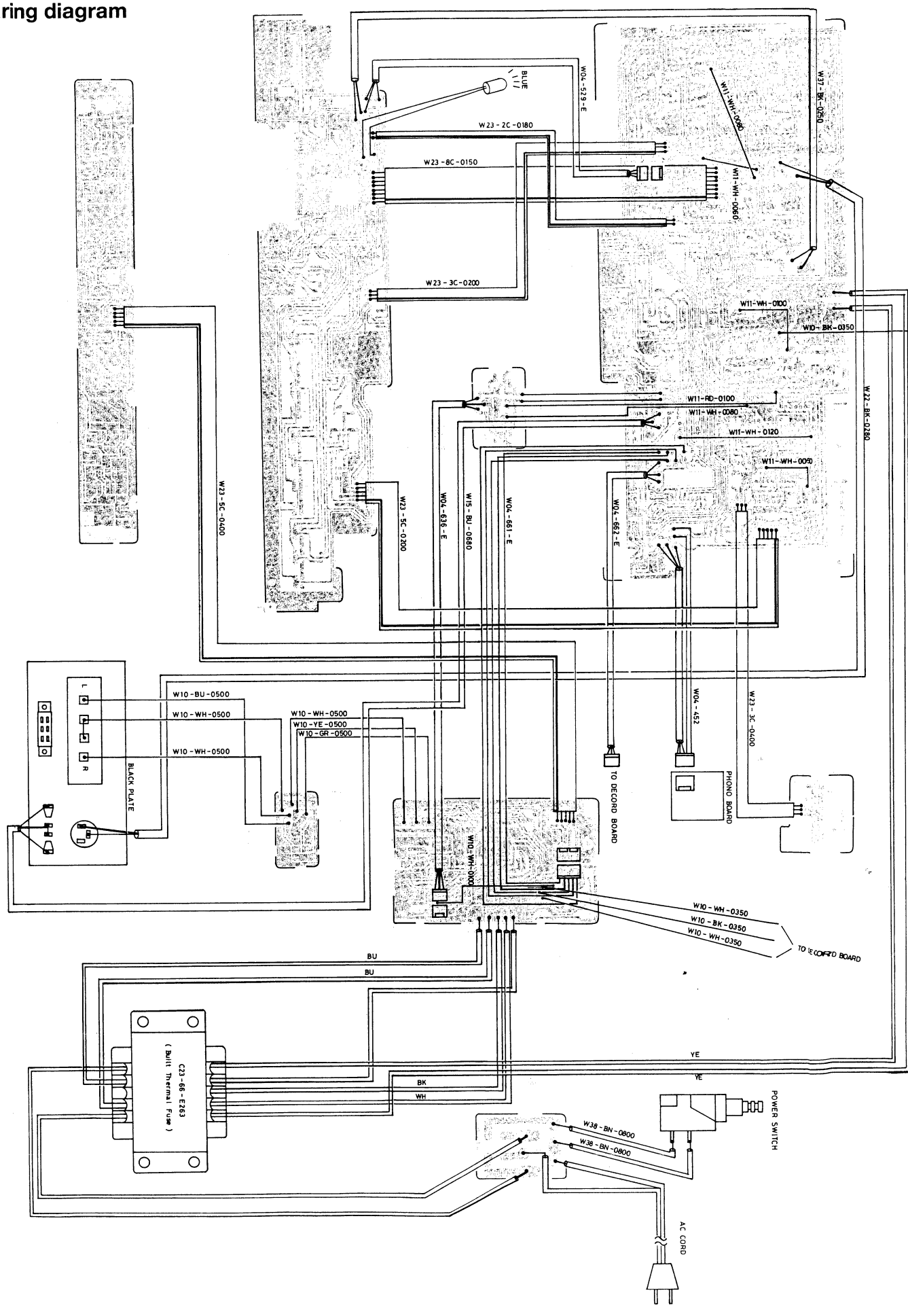


Austrittsöffnung für Laserstrahlung
Discharge orifice for Laser radiation

Hinweis für Original-Etikett:
Schrift und Umrandung schwarz, Untergrund gelb.

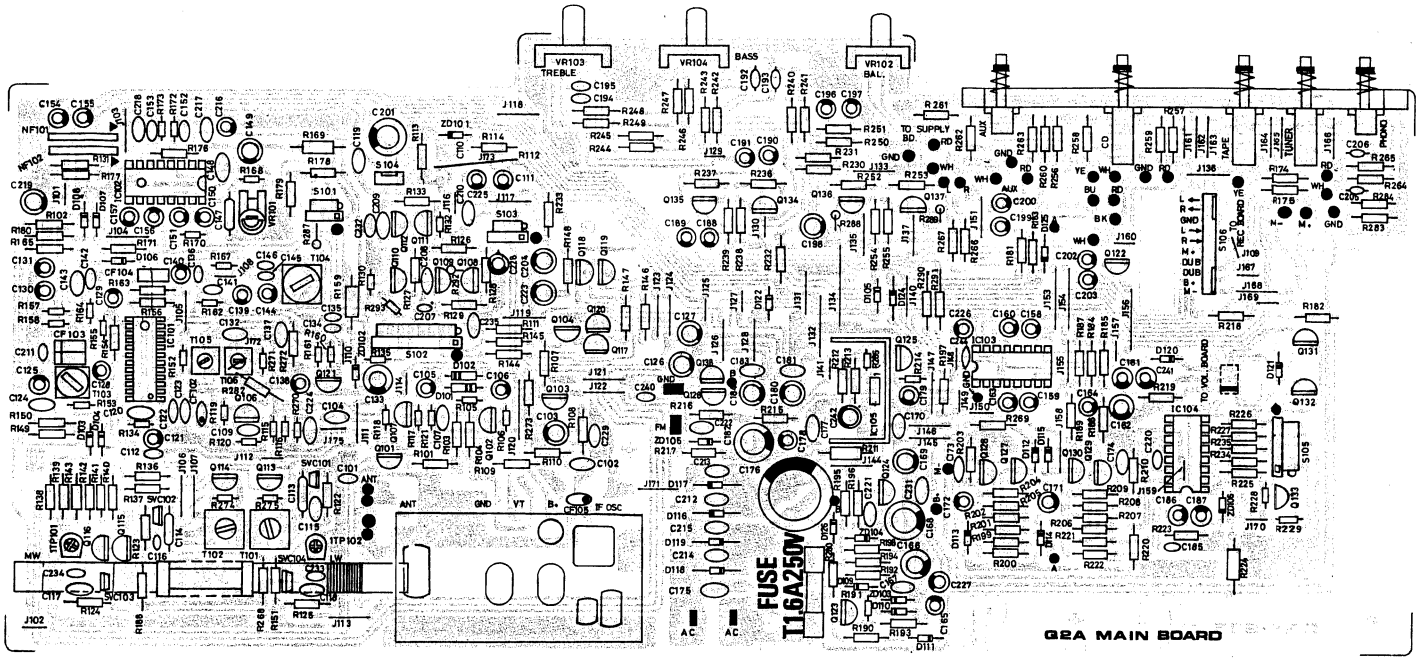
Indication for original label:
Letters and surrounding black, background yellow.

Verdrahtungsplan
Wiring diagram

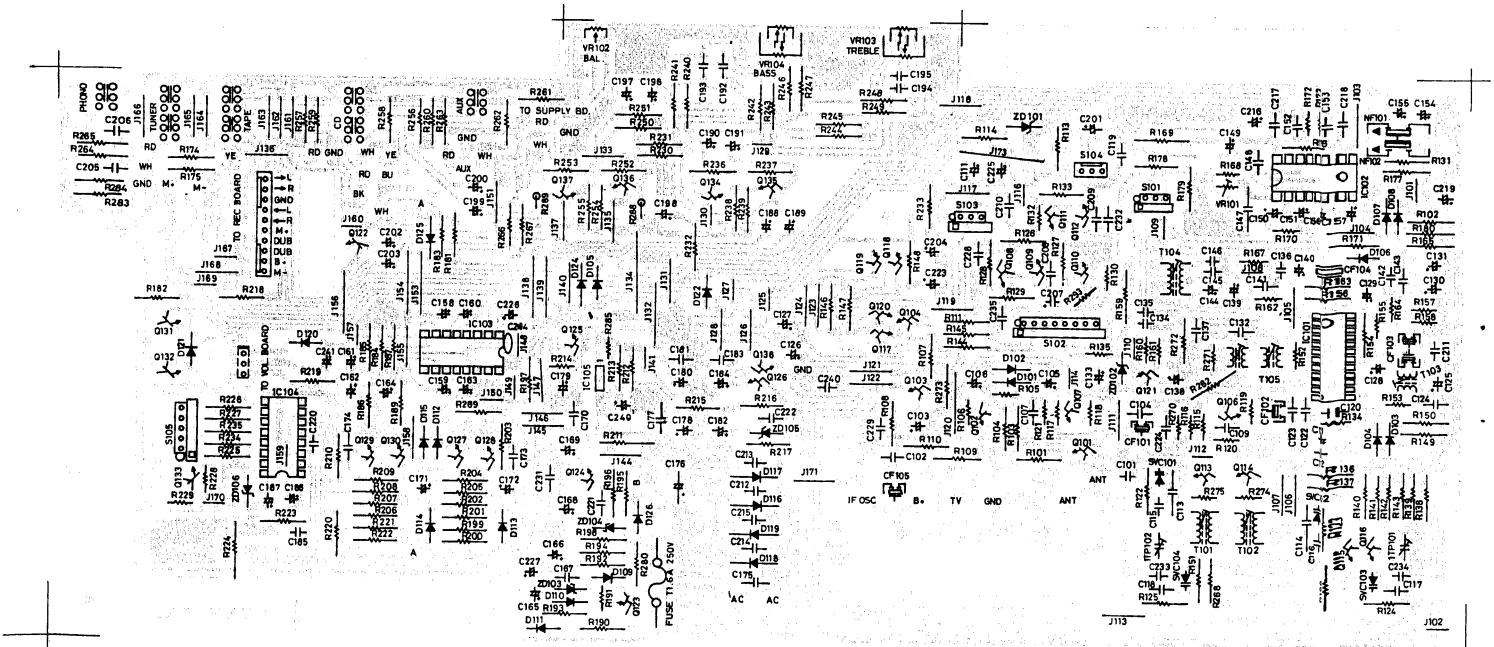


Platinendarstellung Grundplatine
Main PCB diagram

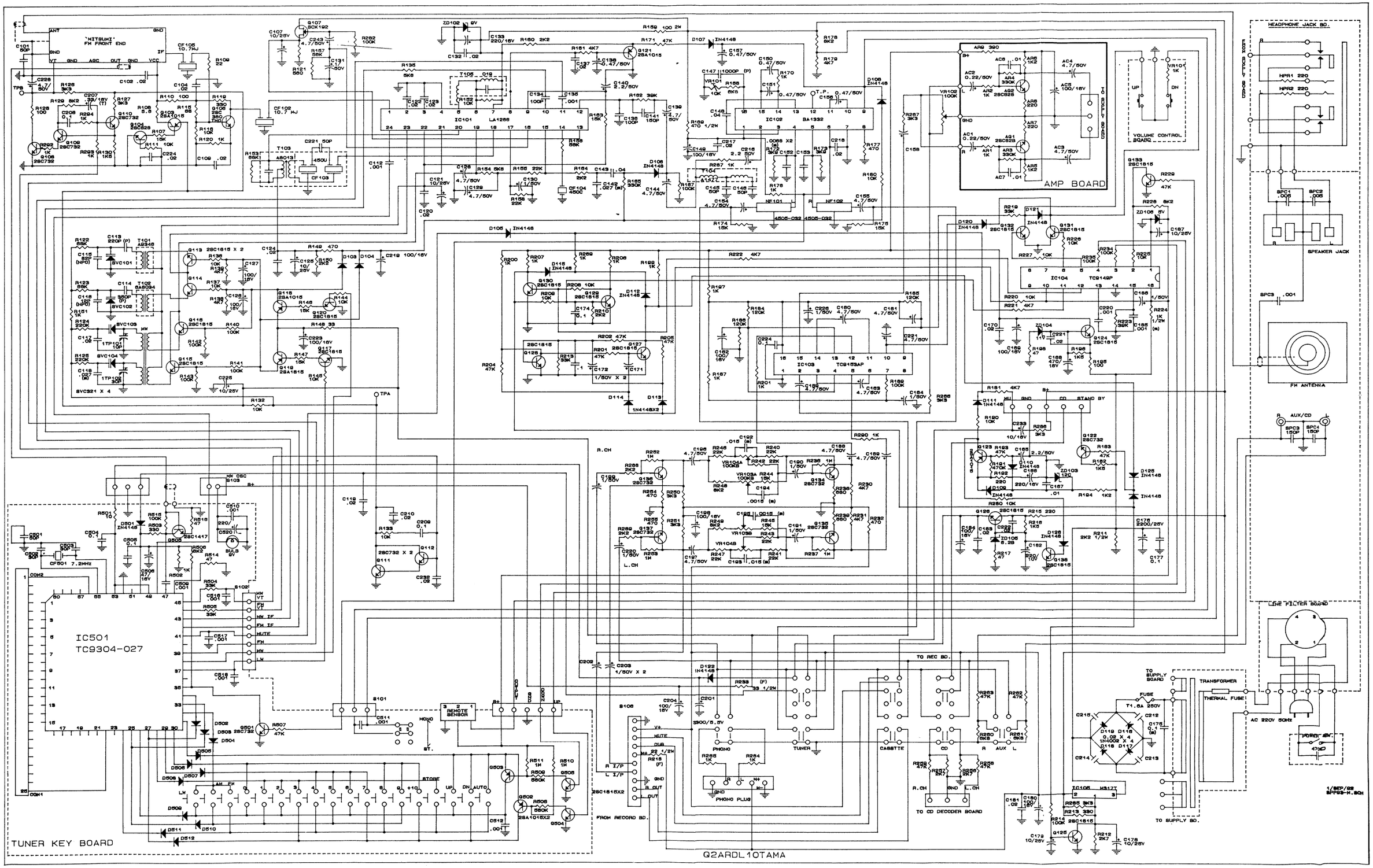
Bestückungsseite
Top view



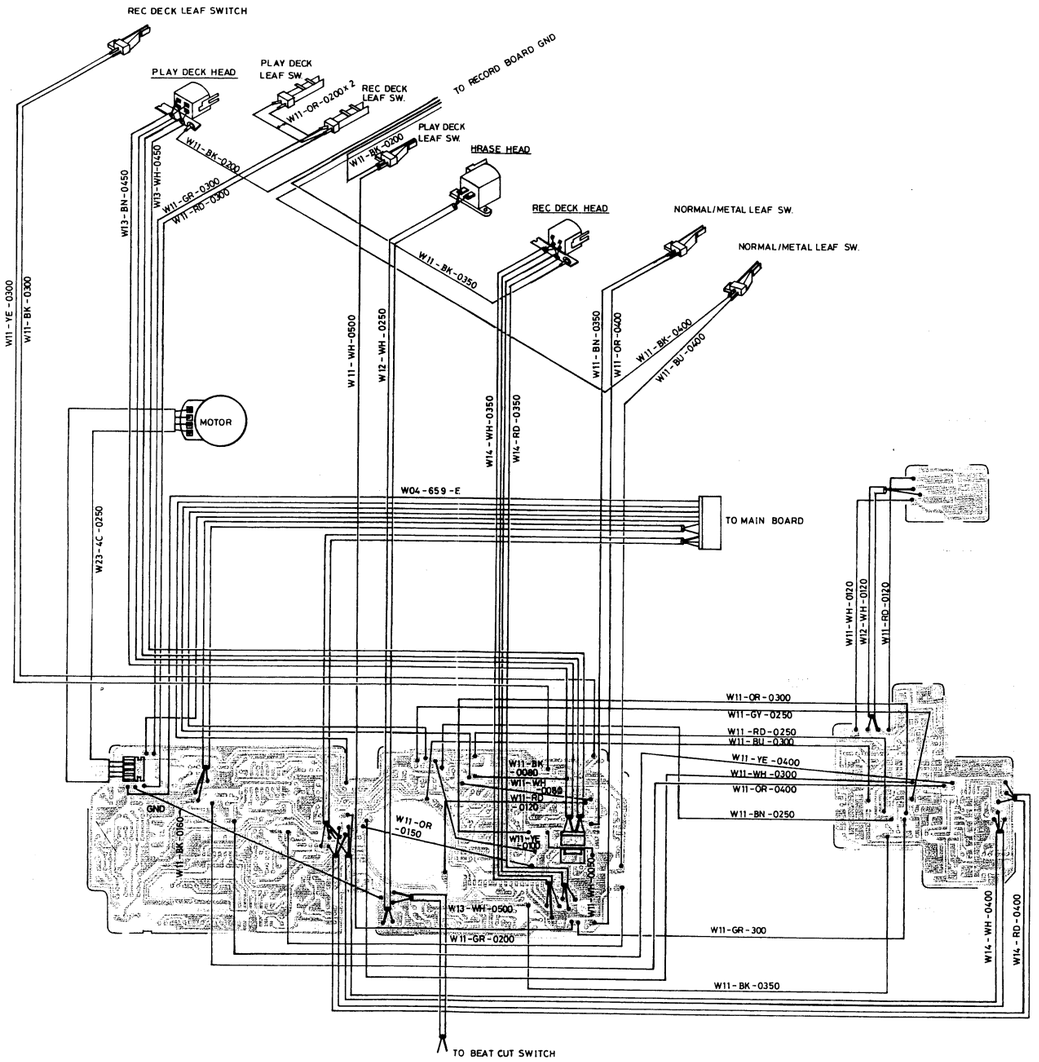
Leiterbahnseite
Bottom view



Schaltbild Grundplatine
Schematic diagram main PCB

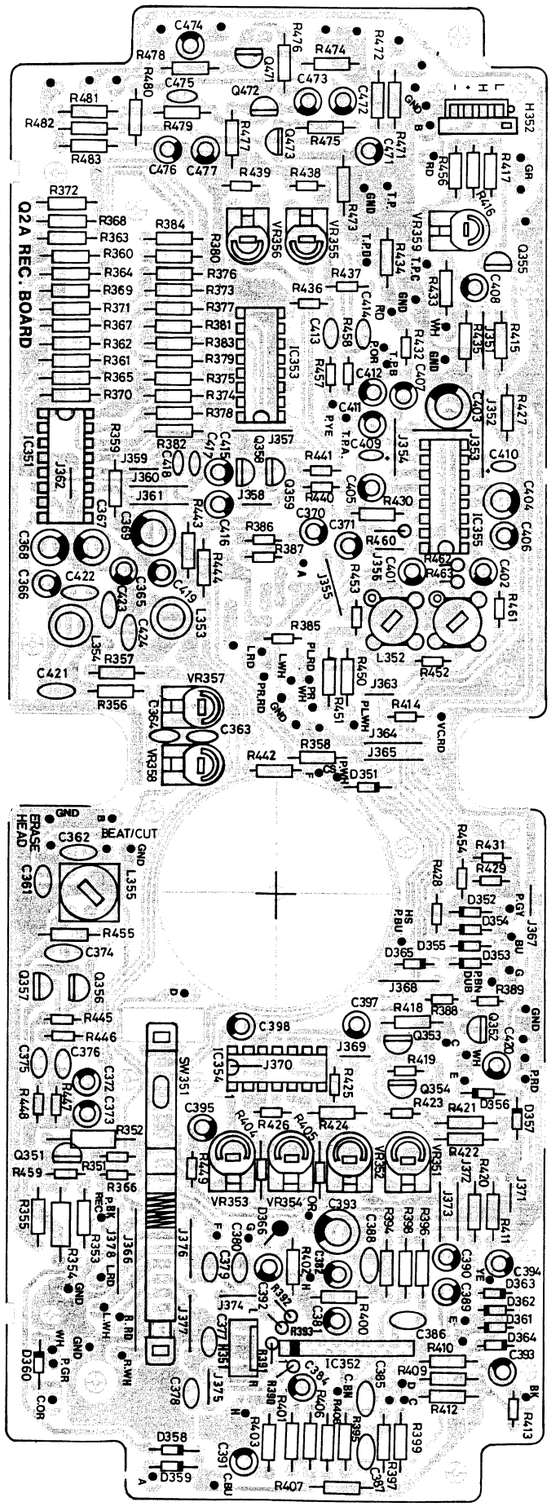


Verdrahtungsplan Cassette, CD
Wiring diagram cassette, CD

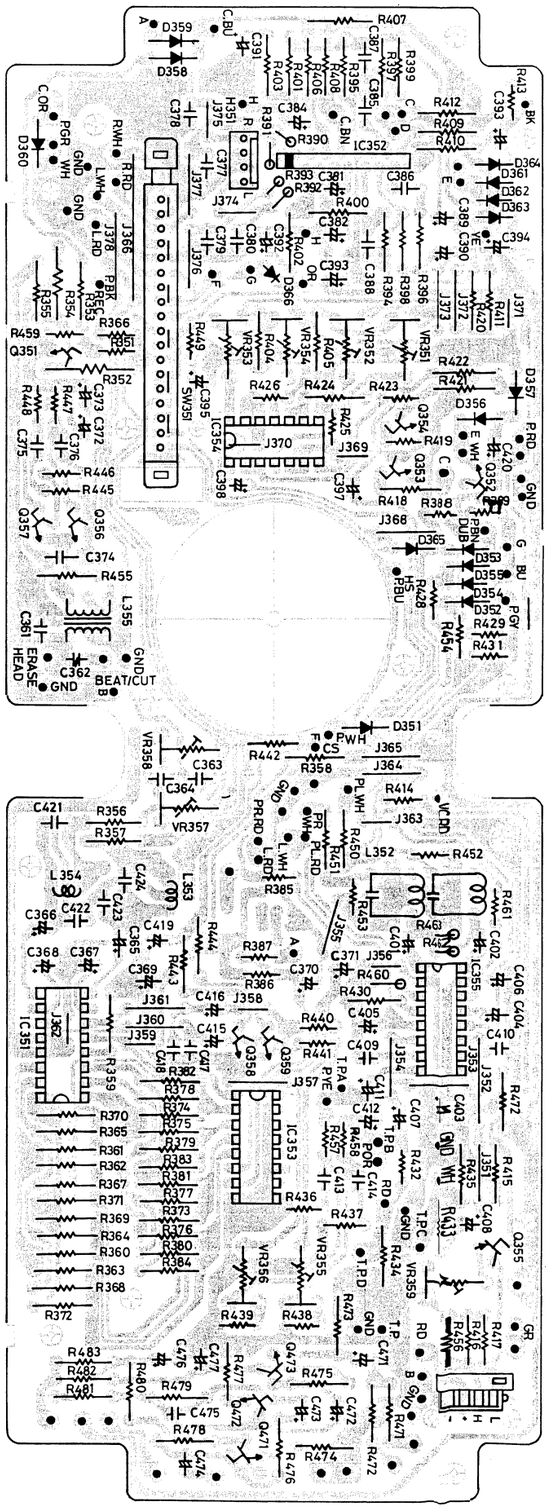


Platinendarstellung Recorderplatine
Record board diagram

Bestückungsseite
Top view

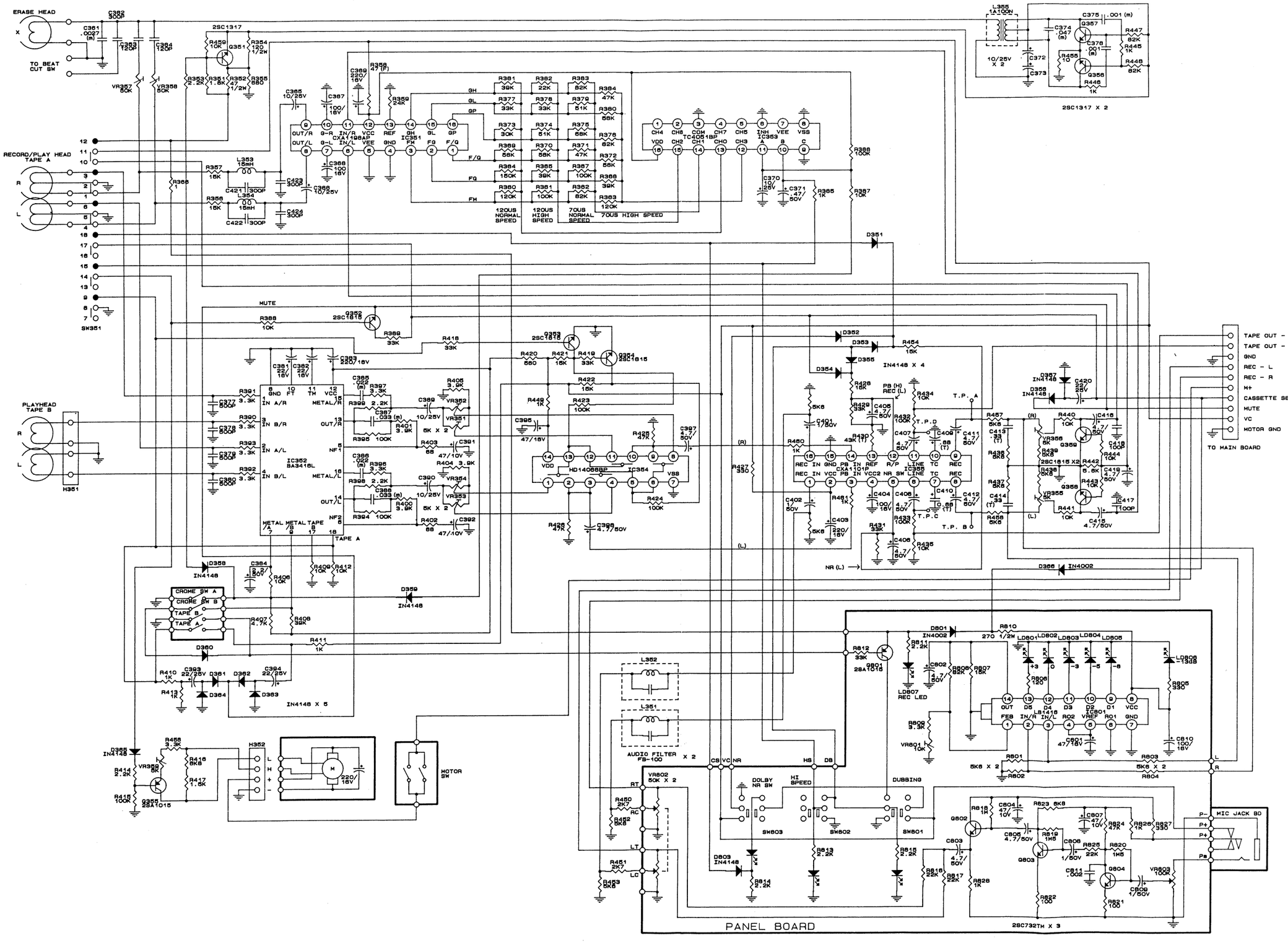


Leiterbahnseite
Bottom view

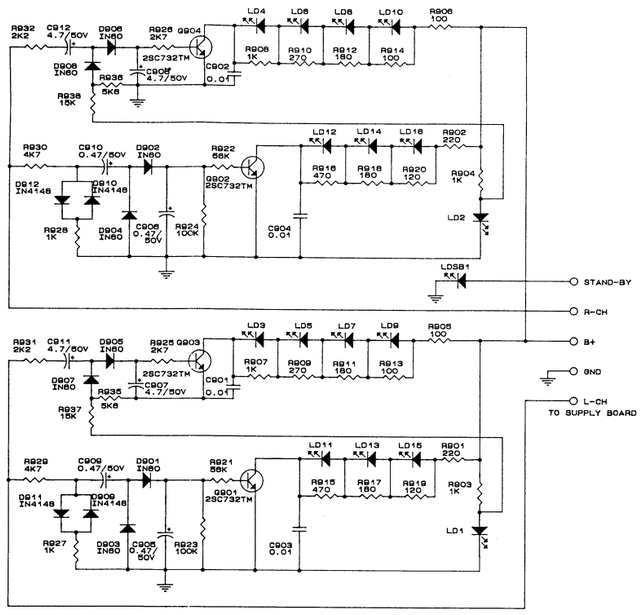


Schaltbild Recorderplatine

Schematic diagram record board

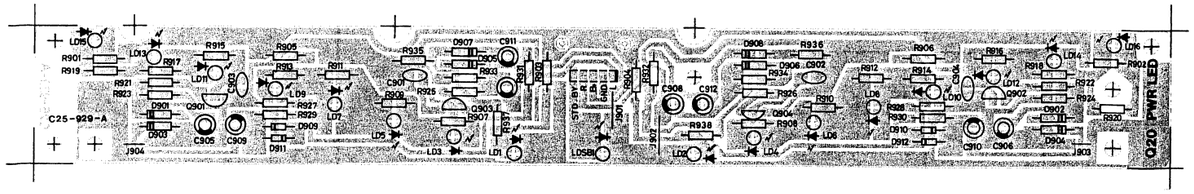


Schaltbild Platine Powermeter
Schematic diagram power LED board

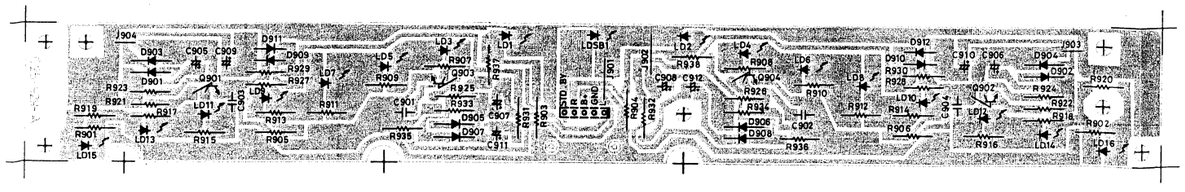


Platinendarstellung Platine Powermeter
Power LED board diagram

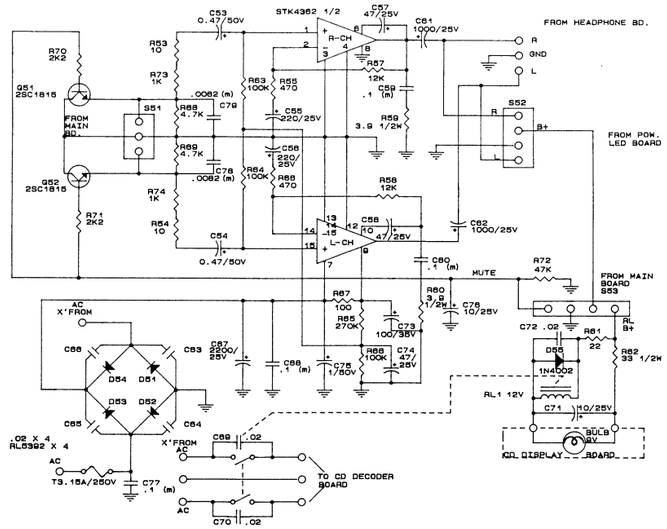
Bestückungsseite
Top view



Leiterbahnseite
Bottom view

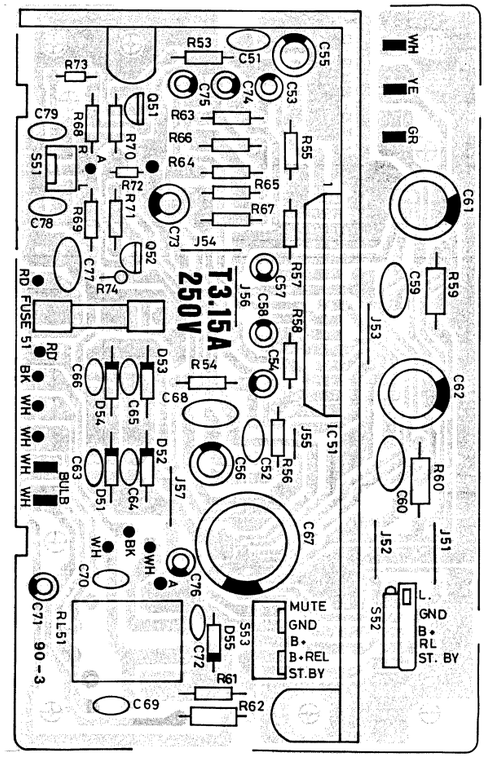


Schaltbild Netzteil/Endstufe
Schematic diagram supply board

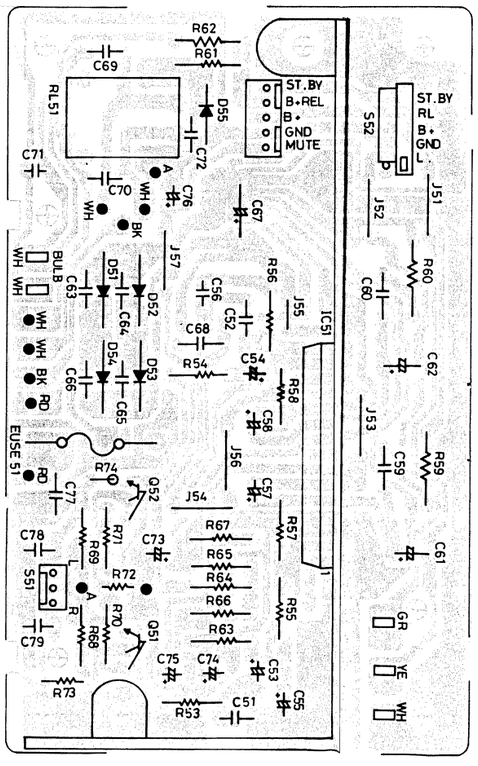


Platinendarstellung Netzteil/Endstufe
Supply board diagram

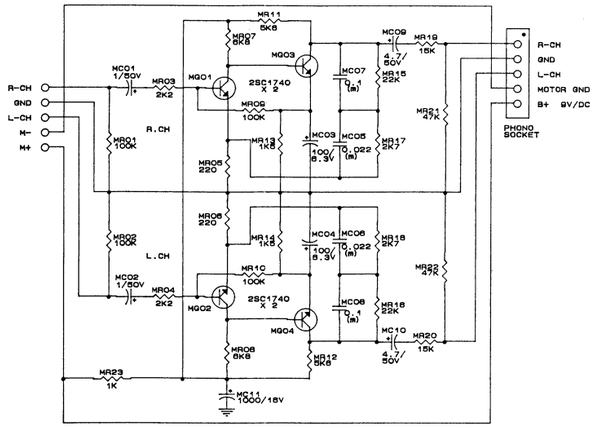
Bestückungsseite
Top view



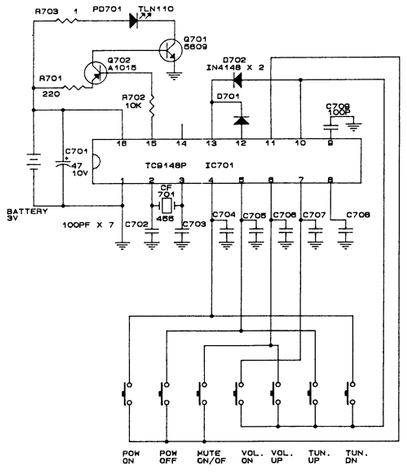
Leiterbahnseite
Bottom view



Schaltbild Phono-Platine
Schematic diagram phono board

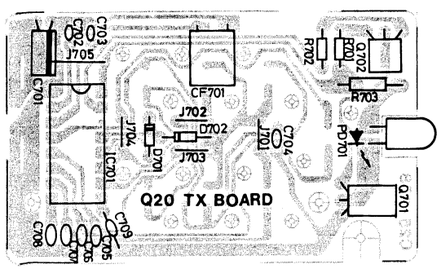


Schaltbild TX-Platine
Schematic diagram TX board

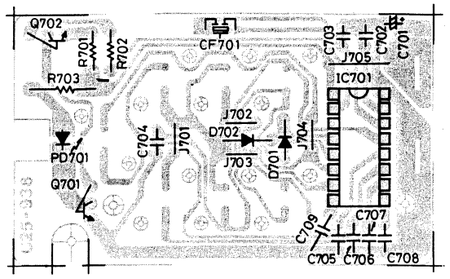


Platinendarstellung TX-Platine
TX board diagram

Bestückungsseite/Top view



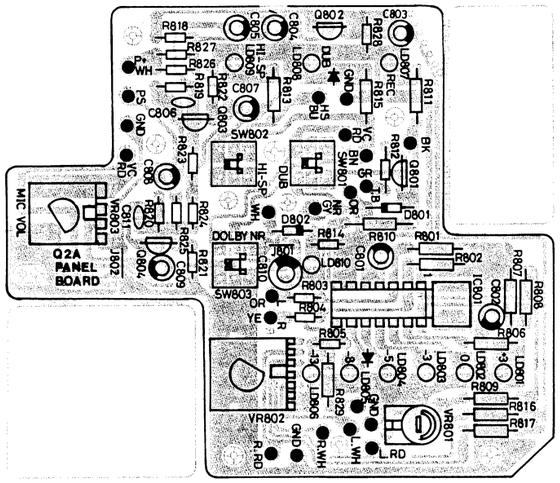
Leiterbahnseite/Bottom view



Platinendarstellungen
PCB diagrams

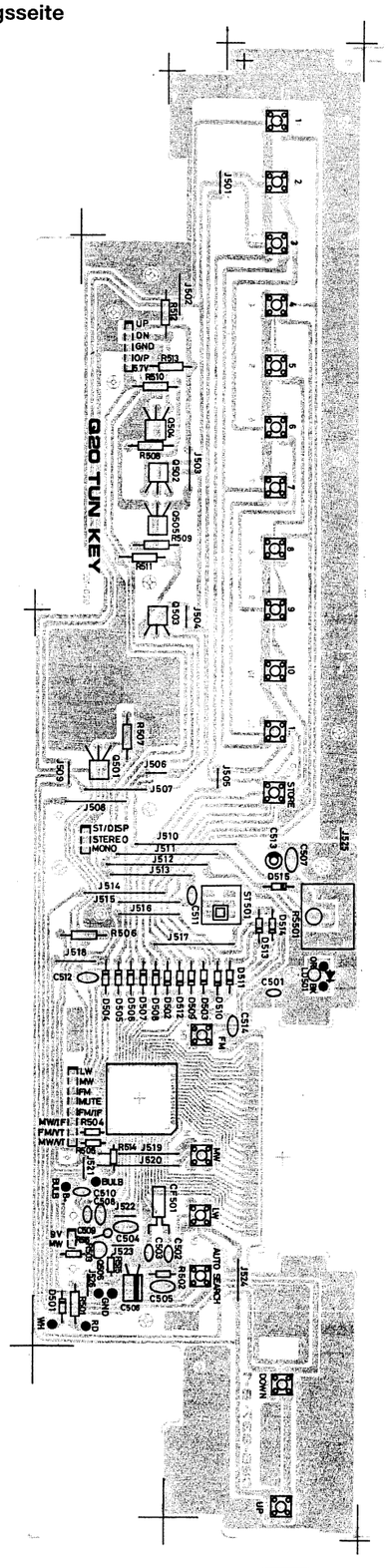
Bedienteilplatine Cassette/Panel board

Bestückungsseite/Top view

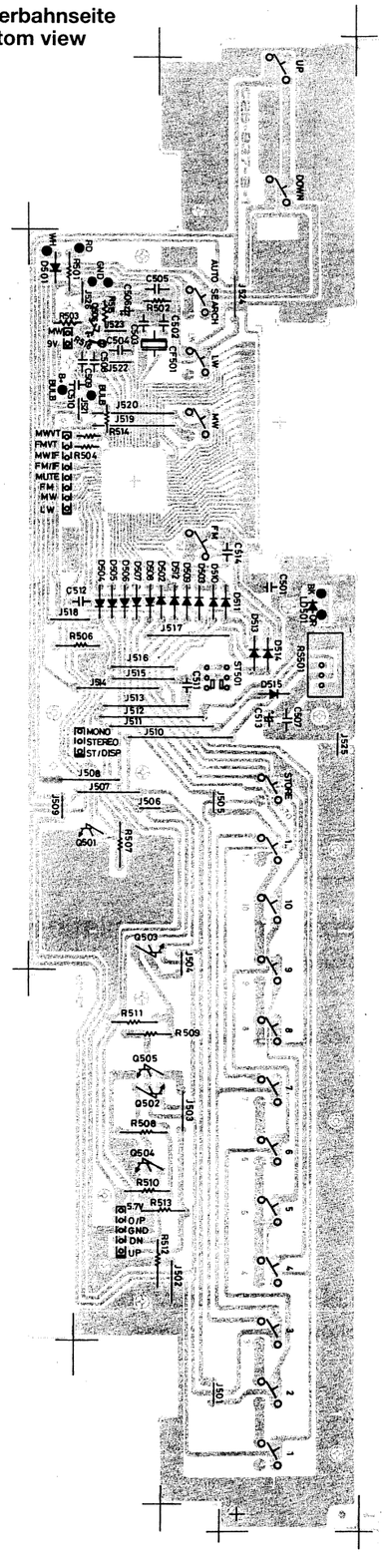


Platinendarstellung Bedienteilplatine Tuner
Tuner key board diagram

Bestückungsseite
Top view

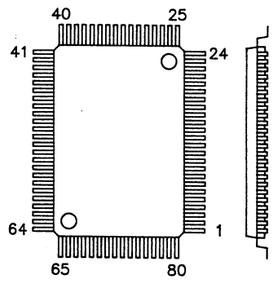


Leiterbahnseite
Bottom view

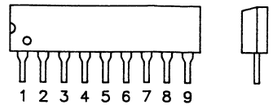


IC- und Transistor-Anschlußbelegung
IC and transistor pin location

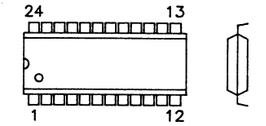
E6188–2 TOP/SIDE VIEWS



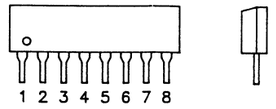
NJM2068S FRONT/SIDE VIEWS



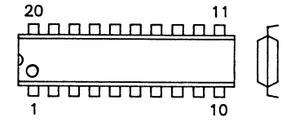
UM6116K–2 TOP/SIDE VIEWS



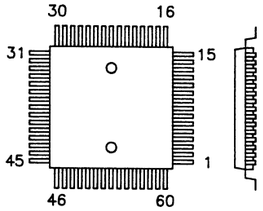
M5218AL FRONT/SIDE VIEWS



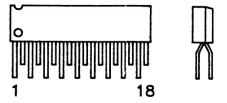
FA5205P TOP/SIDE VIEWS



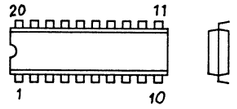
TC9304F–027 TOP/SIDE VIEWS



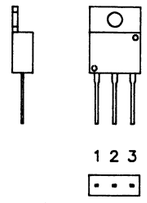
BA3824L TOP/SIDE VIEWS



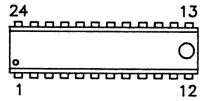
T911H TOP/SIDE VIEWS



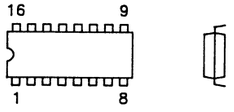
LM317T/BA178M05 TOP/SIDE VIEWS



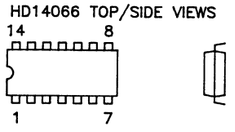
LA1266N TOP VIEW



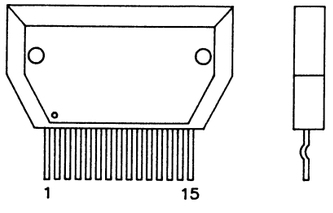
CXA1198A1/CXA1101P/BA1332/
TC40051BP/TC9153P/TC9149P/
TC9148P TOP/SIDE VIEWS



HD14066 TOP/SIDE VIEWS



STK–4362 TOP/SIDE VIEWS



TRANSISTOR	FRONT VIEW	BOTTOM VIEW
2SA1015Y 2SC1815O 2SC1317S 2SC732TM 2SC536HE 2SA608 2SC536	ECB	ECB
2SC3400 2SA3860 2SD1346	ECB	ECB
TERMINAL NAME		
B ⟶ BASE C ⟶ COLLECTOR E ⟶ EMITTER		

IC- und Transistor-Spannungsstabelle
IC and transistor voltage tables

PIN NO.	IC 51 STK4362	IC 101 LA1266	IC 102 BA1332	IC 103 TC9153	IC 104 TC9149	IC 105 LM317T	IC 351 CXA1198	IC 352 BA3416	IC 353 TC4051	IC 354 HD14066	IC 355 CXA1101	IC 701 TC9148	IC 801 LB1416		PIN NO.	IC 501 TC9304F
1	9.38	3.19	6.86	0	0	10.66	1.23	0	0	0	15.01	0.005	0		1-22	2.20
2	7.83	2.65	1.64	4.99	0.18	11.30	1.23	0	0	0	29.88	3.000	0		23-24	4.50
3	0	2.28	1.66	4.96	0	20.03	1.23	0	0	0	5.02	3.168	0		25	0
4	0	3.60	2.06	2.79	0		0	0	0	0	5.04	0	0		26-30	0.22
5	15.98	7.20	2.08	4.97	0		0	5.97	0	8.05	7.61	0	0		31-38	0
6	3.57	8.42	6.74	4.97	0		5.47	5.97	0	8.05	5.08	0	0		39	4.38
7	3.10	8.62	0	9.89	0		5.51	2.75	0	0	0.39	0	0.47		40-41	0
8	0	8.69	0.19	9.98	0		5.95	0	0	0	0.56	0	0.86		42	2.30
9	30.04	0	1.38	9.98	0		6.00	1.22	0	0	5.07	0	0.64		43	0
10	3.70	2.38	1.68	9.98	0		5.57	8.76	0	0	0.38	3.178	0.64		44	1.35
11	15.72	2.38	1.68	4.97	0		5.48	0.68	7.92	0	5.12	3.168	0		45	1.89
12	0	2.39	1.30	4.96	0.06		10.84	9.1	1.24	0	7.60	3.176	0		46	0.40
13	0	2.96	1.68	4.96	5.52		1.21	3.99	1.24	0	1.19	3.154	0		47	2.38
14	6.84	3.36	1.68	4.95	0		1.25	3.96	0	11.07	5.02	3.146	0		48	1.61
15		3.92	1.68	4.95	2.72		1.25	0	1.24		0	3,172			49	4.49
16		0.84	0	10.00	5.54		1.25	0	10.84		5.02	3.174			50	4.42
17		0						0							51-52	0
18		1.58						0							53	4.48
19		2.38													54-55	2.20
20		0													56-60	2.20
21		0														
22		1.15														
23		1.25														
24		1.49														

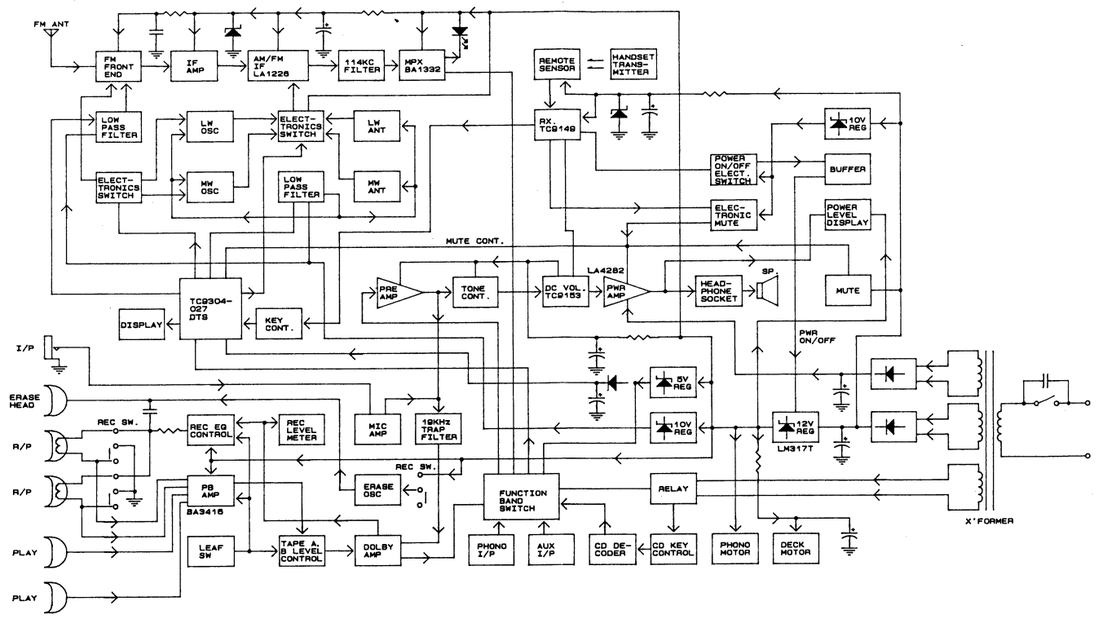
TR	B	C	E
Q51	0	0	0
Q52	0	0	0
AQ1	1.30	4.30	0.66
AQ2	1.30	4.30	0.66
Q103	10.4	11.1	11.2
Q104	0.6	0	0
Q106	0	1.1	3.9
Q107	0	1.4	11.2
Q108	0.6	8.7	0
Q109	1.0	8.7	0.6
Q110	1.7	8.8	1.0
Q111	0.6	0.6	0
Q112	1.1	0.6	0.6
Q113	0	3.4	3.9
Q114	0	3.4	3.9

TR	B	C	E
Q115	0	1.1	3.9
Q116	0	1.1	3.9
Q117	0	10.6	0
Q118	10.6	1.8	11.2
Q119	10.6	0	11.2
Q120	0	10.6	0
Q121	7.2	0	8.1
Q122	0.8	19.8	0.7
Q123	0	1.1	3.9
Q124	10.9	17.3	10.2
Q125	0	10.0	0
Q126	5.9	6.8	5.1
Q127	0.7	0.71	0
Q128	0	10.6	0
Q129	0	0	0
Q130	0	8.9	0
Q131	0	9.8	0

TR	B	C	E
Q132	0	9.9	0
Q133	0.9	0.1	0
Q134	0.6	0.8	0
Q135	0.6	0.7	0
Q136	0.5	3.7	1.1
Q137	1.1	3.8	0.5
Q138	0.8	5.9	0
Q351	0	0	0
Q352	0.11	11.53	0
Q353	0	8.13	0
Q354	0.66	0	0
Q355	6.06	6.7	6.7
Q356	0	0	0
Q357	0	0	0
Q358	0	0	0
Q358	0.70	0	0
Q359	0.70	0	0

TR	B	C	E
Q502	5.0	0.4	1.1
Q503	5.0	1.3	1.5
Q504	0	4.7	0
Q505	0	4.7	0
Q506	0.7	3.4	0
Q801	0	0.12	0
Q802	0.14	0.14	0
Q803	0.14	0.14	0
Q804	0.14	0.14	0
Q901	0.6	3.8	0
Q902	0.6	4.8	0
Q903	0.7	0.1	0
Q904	0.7	0.1	0

Blockschaltbild Tuner, Cassette
Block diagram tuner, cassette



Ersatzteilliste elektrische Teile
Spare parts list electrical parts

Bestell-Nr./ Part. No.	Bezeichnung	Description	Position	Preisgruppe/ Price key
70 039 00	Grundplatine	Main board	57	B0
70 040 00	Platine Powermeter	LED board	76	C3
70 041 00	Netzteilplatine-Endstufe	Supply board	83	E1
70 042 00	Bedienteilplatine Tuner	Tuner key board	36	E8
70 043 00	Recorderplatine	Record board	31	E6
70 044 00	Bedienteilplatine Cassette	Panel board	67	D1
48 362 00	IC LA 1266	IC LA 1266	IC 101	B7
26 473 00	IC BA 1332	IC BA 1332	IC 102	B2
60 396 00	IC TC 9153 TP	IC TC 9153 TP	IC 103	B8
29 836 00	IC TC 9149 P	IC TC 9149 P	IC 104	C3
31 925 00	IC LM 317 T	IC LM 317 T	IC 105	A9
65 926 00	IC CXA 1198 AP	IC CXA 1198 AP	IC 351	C2
37 833 00	IC BA 3416 BL	IC BA 3416 BL	IC 352	B8
26 101 00	IC TC 4051 BP	IC TC 4051 BP	IC 353	B2
70 045 00	IC HD 14066 B	IC HD 14066 B	IC 354	A7
66 766 00	IC CXA 1101 P	IC CXA 1101 P	IC 355	B5
70 046 00	IC STK 4362 (Endstufe)	IC STK 4362	IC 51	C9
48 364 00	IC TC 9304-027 F	IC TC 9304-027 F	IC 501	C9
26 809 00	IC TC 9148 P	IC TC 9148 P	IC 701	C2
13 558 00	IC LB 1416	IC LB 1416	IC 801	B5
48 523 00	Transistor 2 SK 192 GRA	Transistor 2 SK 192 GRA	Q 107	A7
03 726 00	Transistor 2 SC 828 S	Transistor 2 SC 828 S	Q div.	A9
29 019 00	Transistor 2 SC 732 TM	Transistor 2 SC 732 TM	Q div.	A3
60 275 00	Transistor 2 SC 380 TMO	Transistor 2 SC 380 TMO	Q div.	A2
21 736 00	Transistor 2 SC 1815 O	Transistor 2 SC 1815 O	Q div.	A6
12 959 00	Transistor 2 SA 1015 Y	Transistor 2 SA 1015 Y	Q div.	A6
29 022 00	Transistor 2 SC 1317 S	Transistor 2 SC 1317 S	Q div.	A4
29 018 00	Transistor 2 SC 1417 H	Transistor 2 SC 1417 H	Q 506	A3
60 397 00	Transistor HIT 5609	Transistor HIT 5609	Q 701	A3

Ersatzteilliste elektrische Teile
Spare parts list electrical parts

Bestell-Nr./ Part. No.	Bezeichnung	Description	Position	Preisgruppe/ Price key
38 541 00	Diode 1N 4148	Diode 1N 4148	D div.	A0
23 952 00	Diode 1N 4002	Diode 1N 4002	D div.	A1
22 955 00	Diode SVC 321	Diode SVC 321	D div.	B4
70 047 00	Diode 21K 60	Diode 21K 60	D div.	B2
70 048 00	Diode RL 5392	Diode RL 5392	D div.	A2
06 040 00	Zenerdiode ZPD 5,6	Zenerdiode ZPD 5.6	ZD 106	A3
40 679 00	Zenerdiode MTZ 6,2	Zenerdiode MTZ 6.2	ZD 105	A1
37 759 00	Zenerdiode MTZ 9,1	enerdiode MTZ 9.1	ZD 102	A2
34 991 00	Zenerdiode MTZ 11	Zenderdiode MTZ 11	ZD 104	A2
40 680 00	Zenerdiode MTZ 12	Zenerdiode MTZ 12	ZD 103	A1
70 049 00	Leuchtdiode gelb SLR 34 YY 3F	LED yellow SLR 34 YY 3F	div.	A3
70 050 00	Leuchtdiode rot SLR 34 UR 3F	LED red SLR 34 UR 3F	div.	A3
37 383 00	IR-Diode EL-1L1	IR-Diode EL-1L1	PD 701	A9
60 793 00	IR-Empfänger HC 374	IR-receiver HC 374	RS 501	C2
60 403 00	Widerstand 100 Ohm/2 Watt	Resistor 100 Ohm/2 W	R 159	A1
60 402 00	Sicherungswiderstand 22 Ohm/¼ W	Fuse resistor 22 Ohm/¼ W	R 218	A4
60 401 00	Sicherungwiderstand 33 Ohm/½ Watt	Fuse resistor 33 Ohm/½ W	R 233	A4
60 296 00	Potentiometer 10 kOhm	Semi fixed resistor	VR 101	A2
60 297 00	Poti 5 kOhm	Semi fixed resistor 5 K	VR div.	A2
70 051 00	Poti 50 kOhm	Semi fixed resistor 50 K	VR div.	A2
60 299 00	Drehwiderstand Balance	Variable resistor balance	VR 102	A9
60 298 00	Drehwiderstand Bass, Treble	Variable resistor bass, treble	VR 103, 104	B2
70 052 00	Drehwiderstand Rec. Level 50 KB×2	Variable resistor 50 KB×2	VR 802	B0
70 053 00	Drehwiderstand Mikro 100 KB×1	Variable resistor 100 KB×1	VR 803	A7
60 407 00	ZF-Transformator A 9346 EK	IFT A 9346 EK	T 101	A5
60 282 00	Drossel RWO 6A 8034 N	Coil 6A 8034 N	T 102	A4
60 408 00	ZF-Transformator A 8013 EK	IFT A 8013 EK	T 103	A7
29 046 00	Spule A 1477G0	Coil A 1477G0	T 104	A7
60 409 00	ZF-Transformator A019 BZH	IFT A019 BZH	T 105	A7
60 279 00	Keramikfilter AM 10,7 MHz	Ceramic filter SFE 10.7 MJ-A	CF 102	A4
60 404 00	Keramikfilter SFZ 450 B	Ceramic filter SFZ 450 B	CF 103	A9
60 405 00	Keramikfilter BFU 450 C	Ceramic filter BFU 450 C	CF 104	A7
60 280 00	Filter B3ZN 4503-32	Filter B3ZN 4503-32	CF div.	A8
60 406 00	Keramikfilter 7,2 MHZ	Ceramic filter 7.2 MHZ	CF 501	B2
21 797 00	Keramikfilter CSB-455EB	Ceramic filter CSB-455EB	CF 701	A5
66 462 00	Ferritantenne kpl. SPP 93	AM/LW bar set		B6
60 410 00	Trimm-Kondensator 10pF	Trimming capacitor 10pF	TP 101	A4
60 287 00	Trimm-Kondensator 30pF	Trimming capacitor 30pF	TP 102	A4
60 787 00	Tuner FM	FM tuner		E0
60 790 00	Taster	Tact switch	div.	A2
60 792 00	Schalter Mono/Stereo	P.B. switch	ST 501	B0
60 789 00	Tastensatz 5fach Funktion	P.B. switch		C6
70 054 00	Schalter HSD, Dubb., Dolby	PS-22 E06L-0	SW 801, 802, 803	A6
26 982 00	Netzschalter	Power switch	66	B2
60 871 00	Netzdrossel 2,5 µH	Line choke 2.5 µH		B5
70 055 00	Netztrafo	Power transformer	82	D3
60 411 00	LCD Display Tuner BU 5109 EZ	Display tuner BU 5109 EZ	37	D2
60 244 00	Lampe Display 110 mA/10 V	Lamp 110 mA/10 V	40	A6
48 966 00	Mikrofonbuchse	Mic jack	69	B1
60 300 00	Kopfhörerbuchse	Phone jack	56	B1
60 791 00	Relais 30 mA/12 V Standby	Relay 30 mA/12 V	RL 51	B6

Abgleichanweisung Tuner
Alignment procedure tuner

CAUTION: Use isolation transformer of observe polarity when connecting test equipment. Connect low sides of generator and indicator to ground unless specified otherwise. Maintain line voltage at 220V AC. Allow 15-minute warm-up period. Use only enough generator output to obtain suitable indication.

BENÖTIGTE GERÄTE/ INSTRUMENTS REQUIRED:

AM & FM Signal Generator
AM & FM Sweep Generator

AC VTVM Oscilloscope

AM ZF ABGLEICH ALLGEMEIN/AM IF ALIGNMENT GENERAL:

Set output of signal generator no higher than necessary to obtain an output reading.
Set Function Switch to AM.
Set Volume Control to reference output.
Set EQ Control at flat position.
Set Balance Control to center.
Fashion loop of several turns of wire and radiate signal into loop of receiver.

SIGNAL GENERATOR	RADIO SETTING	INDICATOR	ADJUSTMENT	REMARKS
450KHz 400Hz Modulation	Scan to 1620KHz (high end)	VTVM across Speaker Jack.	T103	Adjust for maximum. Repeat until no further improvement is noted.

AM-MW HF ABGLEICH/AM-MW RF ALIGMENT

SIGNAL GENERATOR	RADIO SETTING	INDICATOR	ADJUSTMENT	REMARKS
522kHz 400Hz Modulation	Scan to 522KHz (low end)	VTVM across Speaker Jack.	T102	Adjust the voltage of test point A to 1.2V
1620kHz 400Hz modulation	Scan to 1620KHz (high end)		·	No adjustment.
603kHz	603kHz		AM ANT COIL	Adjust for maximum.
1404kHz	1404kHz		1TP101	Adjust for maximum.

FM ZF ABGLEICH/FM IF ALIGNMENT

Connect the high side of the Sweep Generator through .01 mfd.to CF105, oscilloscope to ground with .01 mfd.
Set Function switch of FM.
Set Volume control to minimum.
Set Balance control to center position.

SIGNAL GENERATOR	RADIO SETTING	INDICATOR	ADJUSTMENT	REMARK
10.7MHz.	Point of non-interference	Connect Scope to + side of C139 and ground to - side of GND	T105	Adjust for maximum gain and symmetry similar to Figur A.

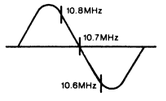


Fig. A

Abgleichanweisung Tuner
Alignment procedure tuner

FM HF ABGLEICH/FM RF ALIGNMENT
GENERAL:

Connect Generator across antenna terminals.
Adjustment of coils should not be attempted unless the coil is deformed or replaced.
Set Function switch to FM.
Set Volume control to reference output.
Set Balance control to center.

SIGNAL GENERATOR	RADIO SETTING	INDICATOR	ADJUSTMENT	REMARKS
87.5MHz 1000Hz modulation	Scan to 87.5MHz (low end)	VTVM across Speaker Jack	No adjustment	
108MHz 1000Hz modulation	Scan to 108MHz (high end)		L7	Adjust the voltage of test point B to 11.2V +/- 0.5V
98MHz 1000Hz modulation	98MHz		L2,3,4,5	Adjust for maximum

MPX ABGLEICH/MPX ALIGNMENT
GENERAL:

Connect the Signal Generator across antenna terminals.
Set Function switch of FM.
Set Volume control to minimum.
Set Balance control to center.

SIGNAL GENERATOR	RADIO SETTING	INDICATOR	ADJUSTMENT	REMARKS
98 MHz at 0 db	98MHz	Connect Frequency Counter to IC102 pin no.12 test point	VR101	Adjust VR101 to read 19kHz on Freq. Counter. Increase input signal to 30 uv and Stereo light will go ON. Increase input signal to 1 mv and measured separation should exceed 27db.

ABGLEICH AUTOMATISCHER SUCHLAUF-FM/FM AUTO SEARCH ALIGNMENT PROCEDURE

NO.	SIGNAL GENERATOR SETTING	RECEIVER SETTING/ PROCEDURE	ADJUSTMENT PROCEDURE/ LOCATION
1	FM 97.9 MHz Output = 1mV 40kHz deviation/ 1kHz	Set receiver to FM 97.9MHz Adjust the speaker output to MIN. distortion	T105
2	Vary the FM frequency To 97.9MHz + 50kHz And 97.9MHz - 50kHz Output = 1mV 40kHz deviation /1kHz	Receiver setting at 97.9MHz Check whether the IC101 pin 8 output volt. is 0V when the signal generator output is at 97.9MHz/ 97.9MHz + 50kHz 97.9MHz - 50kHz	Adjustment is necessary if the DC volt. meter readings do not remain in zero position. Adjust T105 until DC volt. meter readings remain zero at these three FM frequencies input.

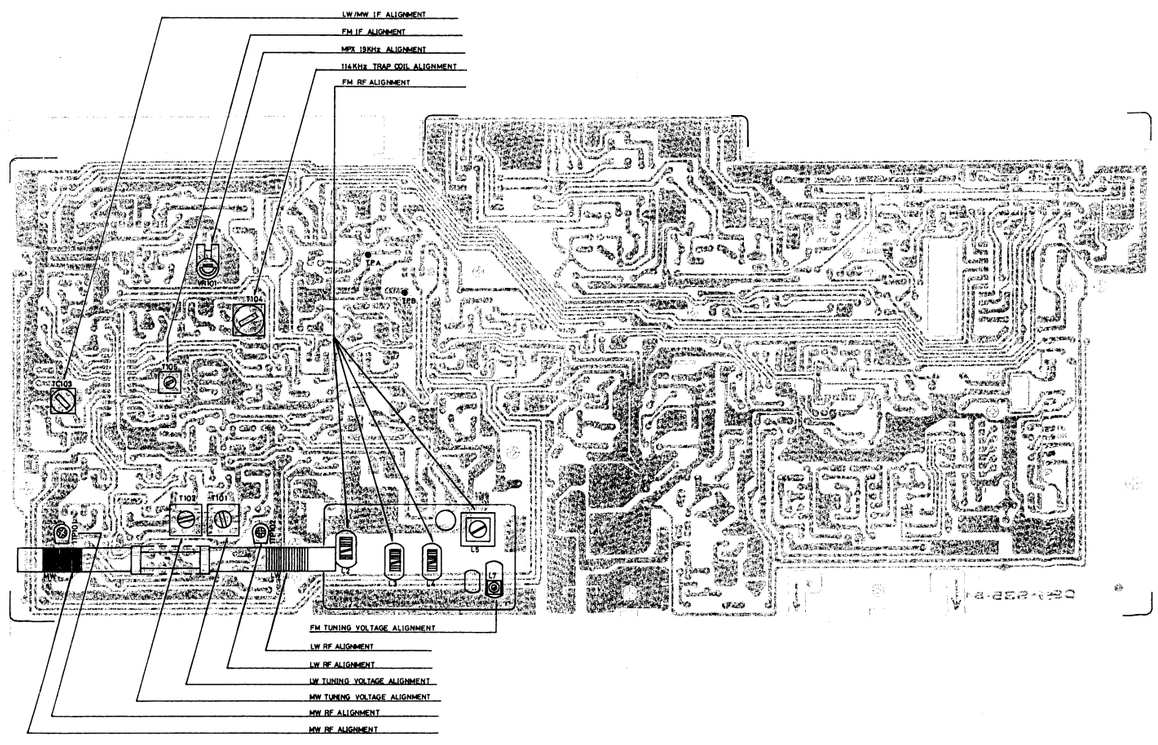
Abgleichanweisung Tuner
Alignment procedure tuner

LW HF ABGLEICH/LW RF ALIGNMENT
GENERAL:

Connect Generator across antenna terminals.
Set Function Switch to LW.
Set Volume Control to reference output.
Set Balance Control to center.

SIGNAL GENERATOR	RADIO SETTING	INDICATOR	ADJUSTMENT	REMARKS
153kHz 400Hz modulation	Scan to 153kHz (low end)	VTVM across Speaker Jack	T101	Adjust the voltage of test point A to 1.5V.
281kHz 400Hz modulation	Scan to 281kHz (high end)		No adjustment	
170kHz 400Hz modulation	170kHz		LW ANT COIL	Adjust for maximum gain
260kHz 400Hz modulation	260kHz		1TP102	Adjust for maximum. Repeat this and previous step until no further improvement is noted

Abgleichpunkte Tuner
Alignment location tuner



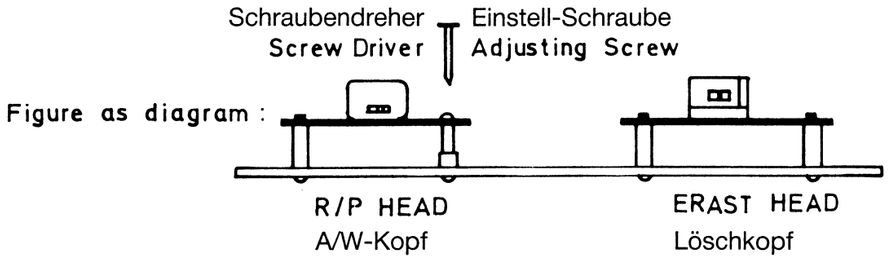
Abgleich Cassette
Alignment procedure cassette

Testcassette Test tape	Abgleich Adjustment method	Abgleichpunkte Adjustment location
1. Geschwindigkeit / Tape speed		
MTT-111	3000 kHz + 60 Hz - 30 Hz	VR 359
2. A/W Kopf Einstellung / Head azimuth		
MTT-113 CN (8k - 10 dB)	Adjust the azimuth until max. output and L and R balance	Tape A (azimuth) Tape B
3. Dolby-Pegel / Dolby level		
MTT-150 (Dolby level 200 nwb/m, 400 Hz)	Adjust until TP A/B level is 245 mV +/- 0.2 dB	Tape A: VR 351 (R) VR 353 (L) Tape B: VR 352 (R) VR 354 (L)
4. Aufnahmepegel LED / Record level LED		
MTT-150	Enter record mode, adjust the level between 0 dB LED and +3 dB LED level	VR 801
5. Vormagnetisierung / Record AC bias		
	Enter rec. mode, connect to azimuth head and adjust until AC millivoltmeter comes within 8.6 V +/- 0.2 V (normal tape)	VR 357, VR 358
6. Aufnahmepegel / Record level		
AUX input 400 Hz 400 mV	Set record level to -8 dB (LED). Level difference between recording and play has to be within +/- 1 dB	VR 355, VR 356
7. AUX Eingangskontrolle / AUX I/P signal checking		
AUX input 400 Hz 400 mV	TP A/B = 245 +/- 0.5 d B	VR 802 between one o'clock and two o'clock position
8. Aufnahmesignal 19 kHz Unterdrückung / Record signal 19 kHz rejection		
AUX input 19 kHz 400 mV or rec input 19 kHz, 195 mV. Turn VR 802 to 0 dB position.	Enter record mode, connect to IC 355 pin 1/pin 16. Adjust until min. output, spec.: below -37 dBV	L 351, L352 should meet the spec. under normal working condition, need not to adjust under normal condition.

Löschspannung: **CR ca 130 Vss**
FE ca 85 Vss

Vormagnetisierung: **CR ca 36 Vss**
FE ca 26 Vss

Abgleich Azimuth
Alignment procedure head azimuth

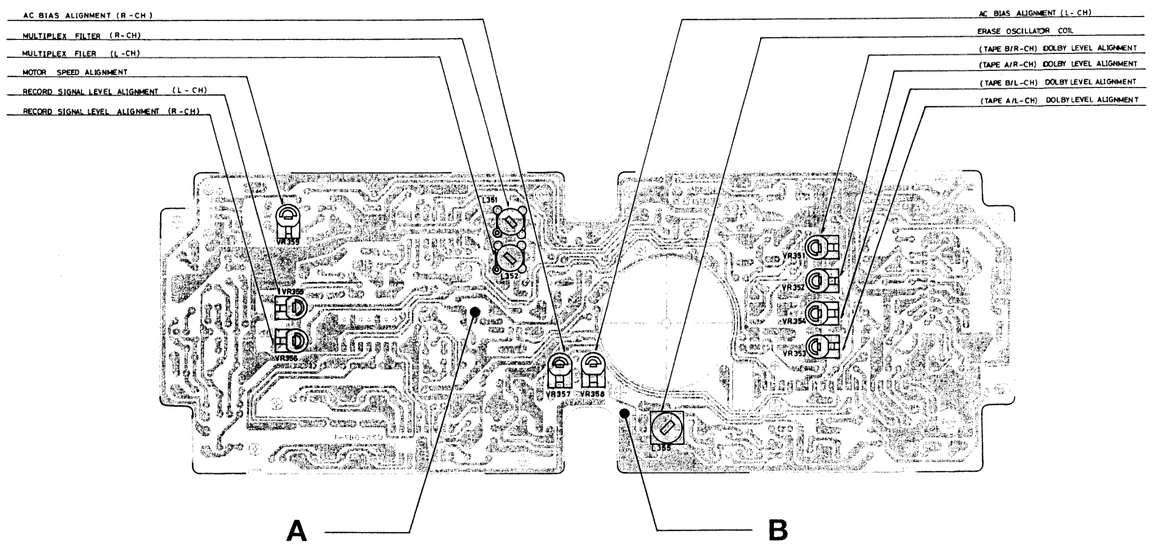


HEAD AZIMUTH: While playing test tape (10 kHz).
Adjust azimuth screw on the left side of the tape head for maximum output for both L/R channel.
Testcassette (10 kHz) abspielen.
Mit der Azimuth-Schraube links des Kopfes maximales Ausgangssignal für beide Kanäle (L/R) einstellen.

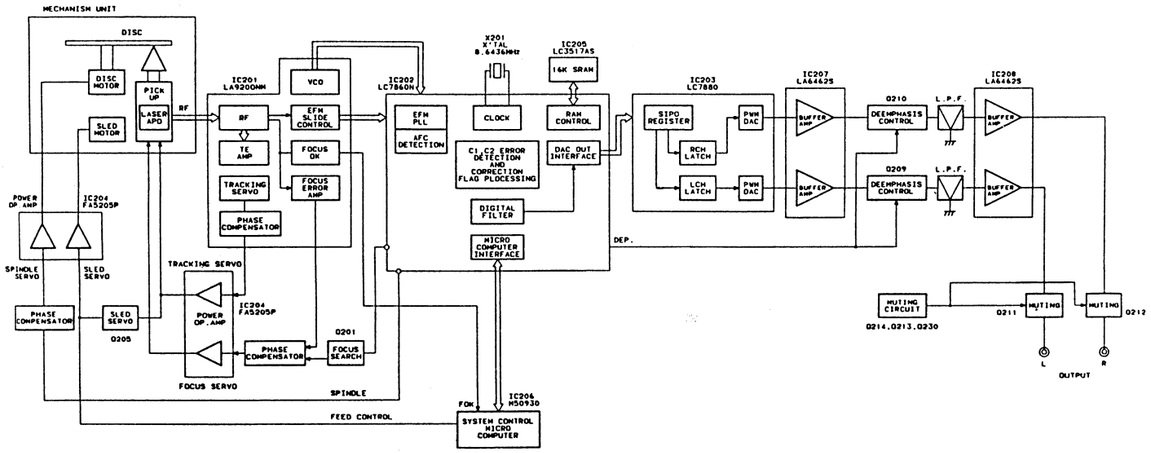
INSTRUMENTS: AC-VOLTMETER
FREQUENCY COUNTER

MESSGERÄTE: AC-VOLTMETER
FREQUENZZÄHLER

Abgleichpunkte
Alignment location



Blockschaltbild CD Hauptplatine
Block diagram CD main P.C.B.



IC Spannungstabelle CD
IC voltage table CD

IC PIN NUMBERS DC VOLTAGES																					
Ref. No.	**DEVICE**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
IC201	LA9200NM	0V	0V	0.3V	0V	0V	0V	0V	0V	0V	0V	0.6V	0.6V	0V	4.9V	4.4V	4.3V	4.2V	4.2V	−5.6V	2.4V
		21	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**	**37**	**38**	**39**	**40**
		5.0V	2.7V	2.3V	2.3V	0V	2.4V	0V	2.5V	2.4V	0V	0V	0.6V	0.6V	0V	−0.2V	0V	0V	10.0V	4.5V	5.9V
		41	**42**	**43**	**44**	**45**	**46**	**47**	**48**	**49**	**50**	**51**	**52**	**53**	**54**	**55**	**56**	**57**	**58**	**59**	**60**
		0V	0V	−5.6V	0V	0V	0V	0V	0V	-	-	-	-	-	-	-	-	-	-	-	-

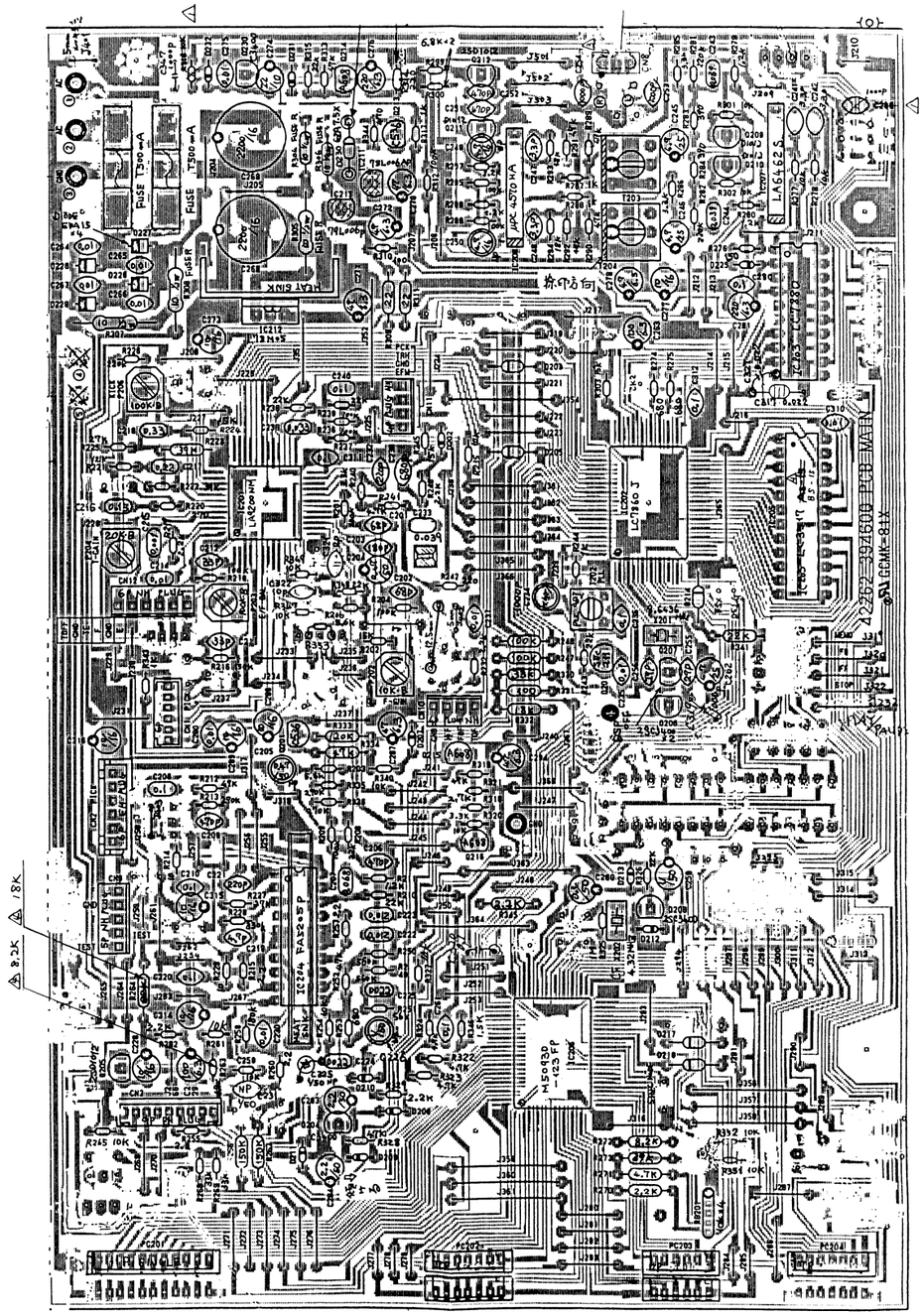
IC PIN NUMBERS DC VOLTAGES																					
Ref. No.	**DEVICE**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
IC202	LC7860J	0V	2.6V	2.6V	2.4V	0V	2.4V	2.2V	2.7V	0V	5.0V	0.8V	0V	0.2V	0.2V	4.2V	4.2V	4.3V	0V	2.7V	4.9V
		21	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**	**37**	**38**	**39**	**40**
		0V	0.6V	0.6V	0V	0V	0V	1.1V	0V	5.0V	5.0V	5.0V	0V	5.0V	5.0V	0V	0V	5.0V	0V	0V	5.0V
		41	**42**	**43**	**44**	**45**	**46**	**47**	**48**	**49**	**50**	**51**	**52**	**53**	**54**	**55**	**56**	**57**	**58**	**59**	**60**
		5.0V	5.0V	0V	0V	5.0V	5.0V	5.0V	5.0V	0V	5.0V	5.0V	0V	0.8V	0.8V	0.8V	0V	2.4V	2.4V	2.4V	2.4V
		61	**62**	**63**	**64**	**65**	**66**	**67**	**68**	**69**	**70**	**71**	**72**	**73**	**74**	**75**	**76**	**77**	**78**	**79**	**80**
		2.4V	0.6V	0.6V	0.6V	0V	5.0V	0V	0.7V	0V	0V	0V	5.0V	5.0V	0V	5.0V	0V	0V	0V	0V	5.0V

IC PIN NUMBERS DC VOLTAGES																					
Ref. No.	**DEVICE**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
IC203	LC7880	2.6V	5.2V	0V	5.2V	5.0V	5.0V	5.0V	0V	0V	5.2V	2.5V	0V	0V	0V	0V	0V	0V	3.5V	0V	2.6V
IC204	FA5205P	0V	0V	0V	−13.1V	−13.7V	−13.7V	0V	0V	0V	12.7V	0V	0V	0V	−12.7V	−13.7V	−13.7V	0.6V	0V	0V	12.7V
IC207	LA6462SS	5.9V	2.6V	2.6V	2.6V	−5.0V	2.6V	2.6V	2.6V	5.9V	-	-	-	-	-	-	-	-	-	-	-
IC208	UPC4570HA	5.9V	0V	0V	0V	−5.0V	0V	0V	0V	5.9V	-	-	-	-	-	-	-	-	-	-	-
IC211	TA78L006	12.6V	5.9V	0V	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IC212	NJM78M	12.5V	0V	5.0V	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IC213	TA79L006	0V	−6.0V	−13.4V	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IC205	LC3517AS	5.0V	5.0V	5.0V	5.0V	0V	5.0V	5.0V	0V	0.8V	0.8V	0.8V	0V	2.4V	2.4V	2.4V	2.4V	2.4V	0V	5.0V	5.0V
		21	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**	**37**	**38**	**39**	**40**
		5.0V	0V	0V	5.0V	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

IC PIN NUMBERS DC VOLTAGES																					
Ref. No.	**DEVICE**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
IC206	M50930	0V	2.4V	2.4V	2.4V	2.4V	2.4V	2.4V	2.4V	2.4V	2.4V	2.4V	2.4V	2.4V	1.6V	3.2V	4.9V	5.0V	0.2V	0V	5.0V
		21	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**	**37**	**38**	**39**	**40**
		0V	0V	0V	0V	0V	0V	0.6V	0V	5.0V	2.2V	1.9V	0V	5.0V	5.0V	5.0V	5.0V	5.0V	5.0V	5.0V	4.9V
		41	**42**	**43**	**44**	**45**	**46**	**47**	**48**	**49**	**50**	**51**	**52**	**53**	**54**	**55**	**56**	**57**	**58**	**59**	**60**
		0V	0V	4.9V	4.9V	0V	0V	4.7V	4.8V	4.9V	4.9V	0V	0V	4.9V	4.8V	5.0V	0V	2.4V	2.4V	2.4V	2.4V
		61	**62**	**63**	**64**	**65**	**66**	**67**	**68**	**69**	**70**	**71**	**72**	**73**	**74**	**75**	**76**	**77**	**78**	**79**	**80**
		0V	2.4V	2.4V	2.4V	0.8V	2.4V	0.8V	2.4V	2.4V	2.4V	2.4V	2.4V	0V	2.4V	2.4V	2.4V	2.4V	2.4V	2.4V	2.4V

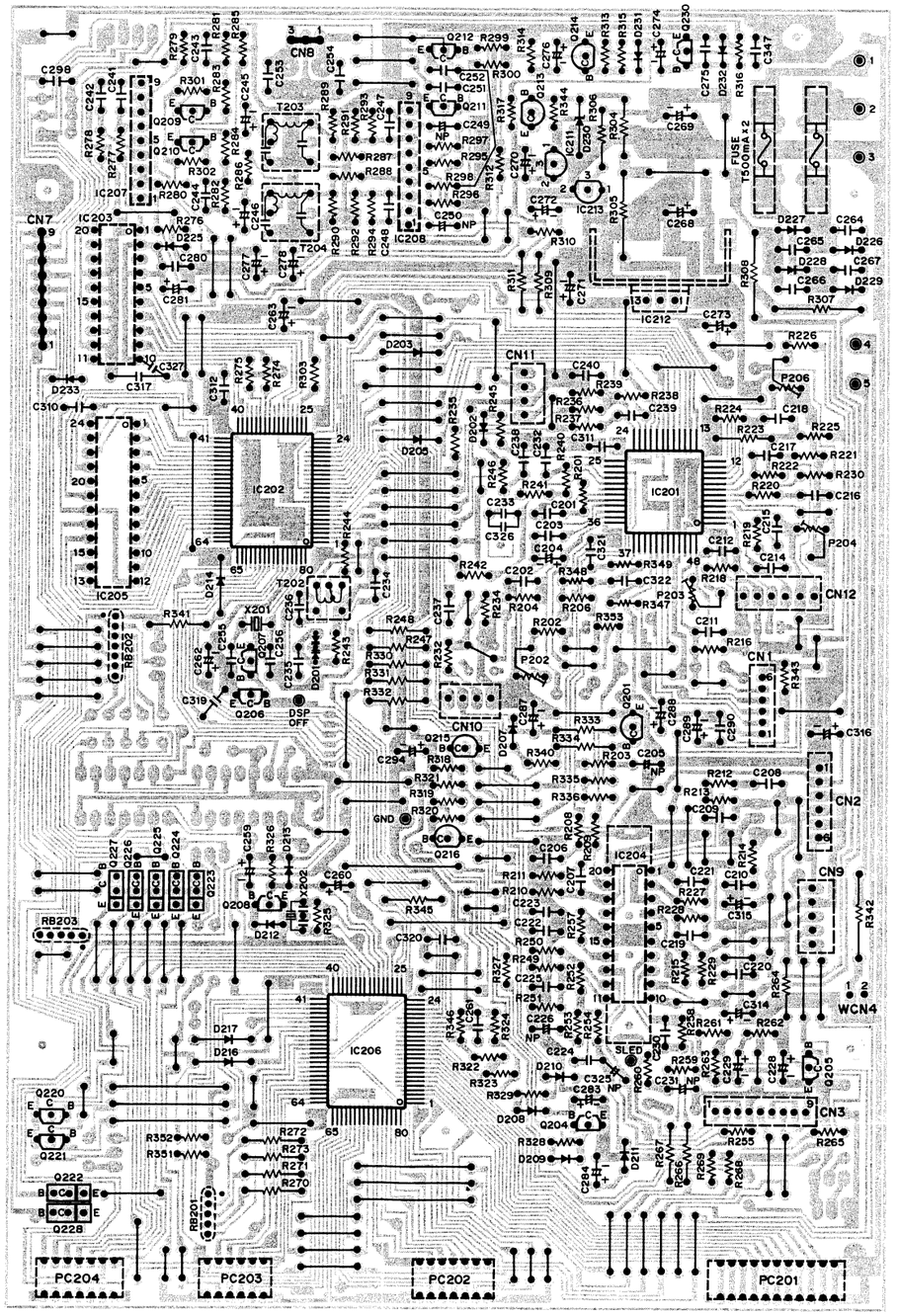
Platinendarstellung CD Hauptplatine
CD main board diagram

Bestückungsseite
Top view

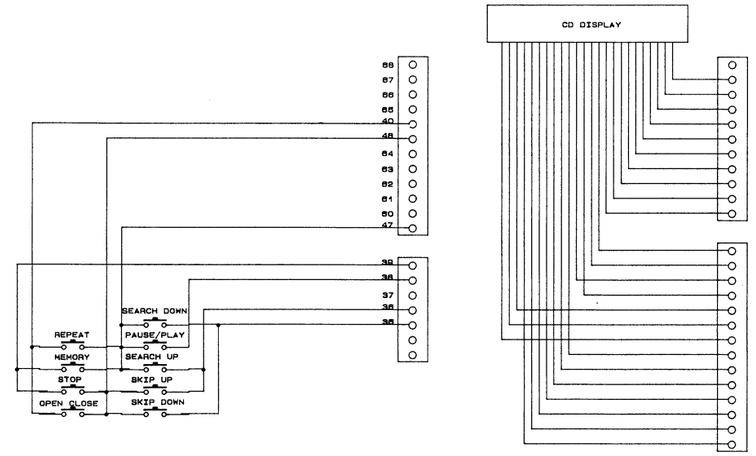


Platinendarstellung CD Hauptplatine
CD main board diagram

Leiterbahnseite
Bottom view

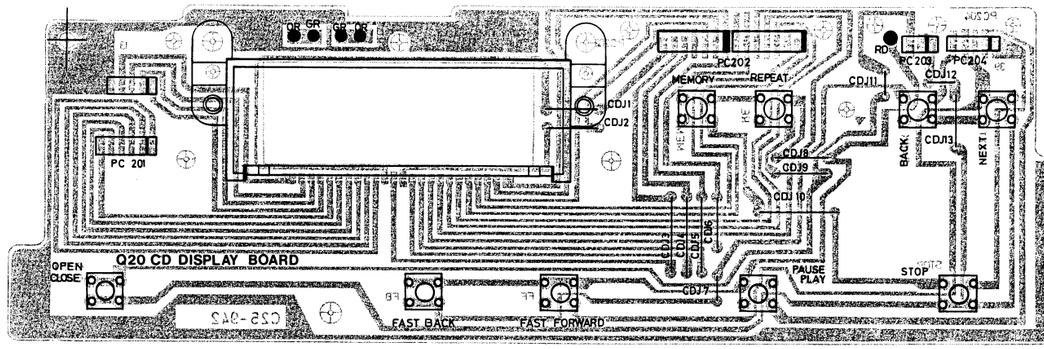


Schaltbild Display-Platine CD
Schematic diagram CD display board

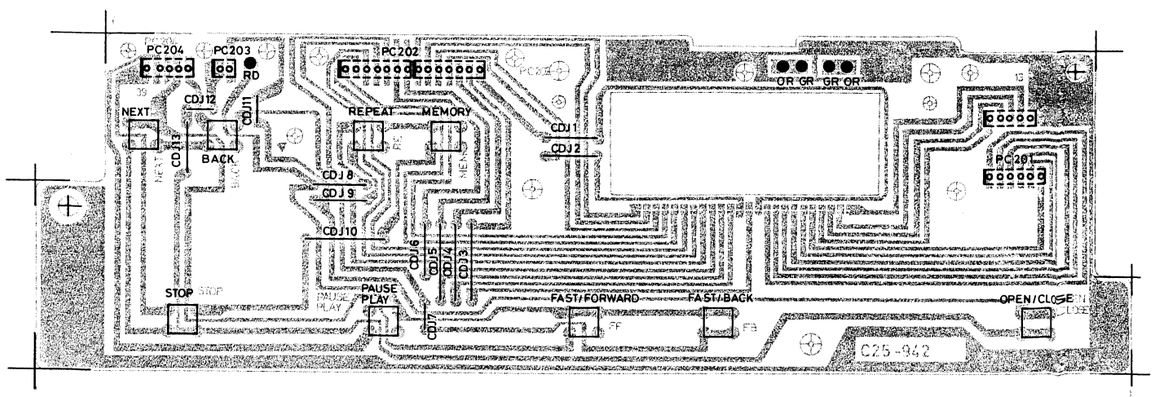


Platinendarstellung Bedienteilplatine CD
CD key PCB diagram

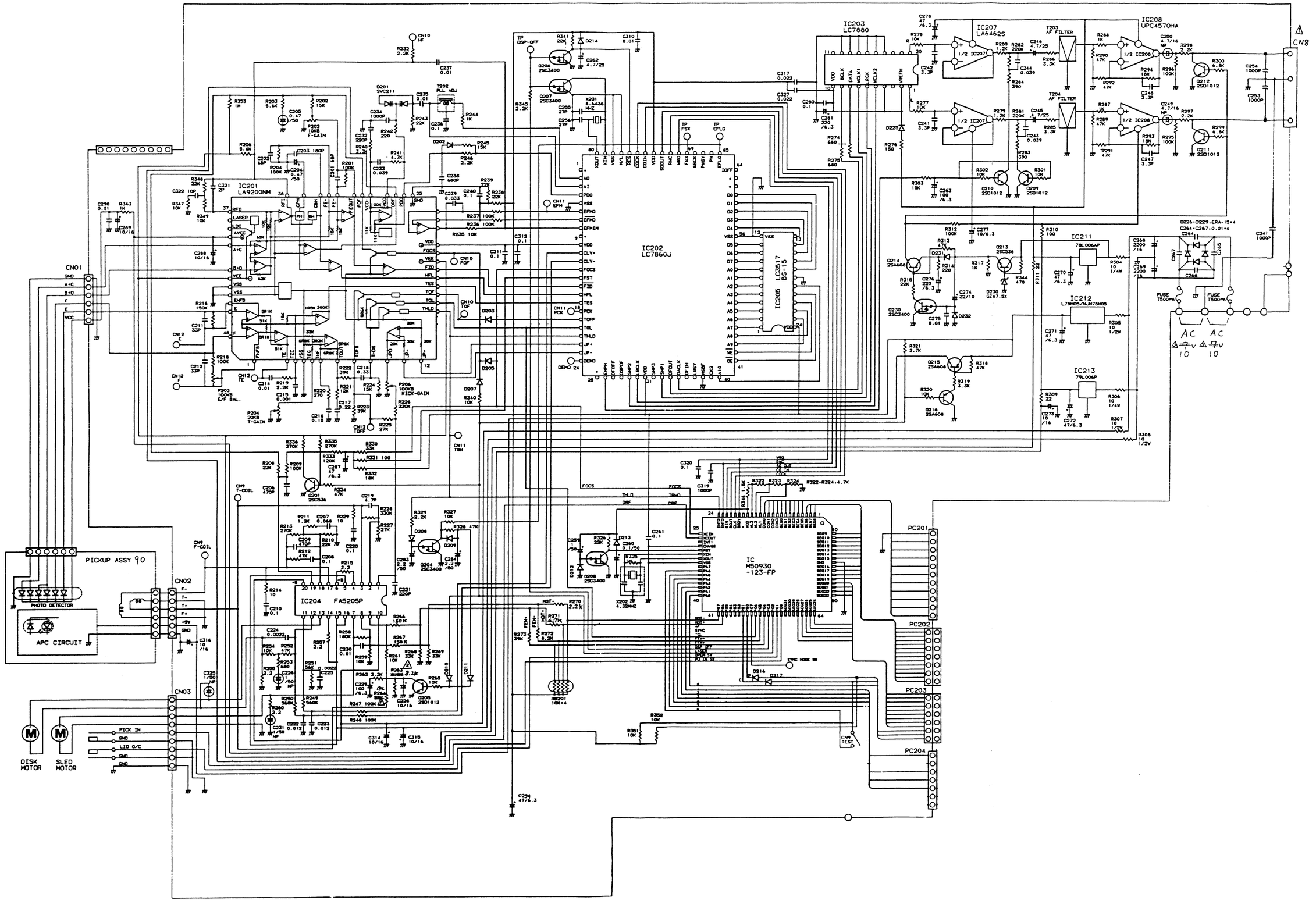
Bestückungsseite
Top view



Leiterbahnseite
Bottom view



Schaltbild CD Hauptplatine
Schematic diagram CD main board



Ersatzteilliste CD elektrische Teile
Spare parts list CD electrical parts

Bestell-Nr./ Part. No.	Bezeichnung	Description	Position	Preisgruppe/ Price key
60 356 00	Grundplatine CD	Decoder PCB	80	G0
60 483 00	CD-Display-Platine	CD key PCB	89	D8
48 407 00	IC LA 9200 NM	IC LA 9200 NM	IC201	C6
45 316 00	IC LC 7881 M	IC LC 7881 M	IC203	C5
60 357 00	IC FA 5205 P	IC FA 5205 P	IC204	C7
65 361 00	IC LC 3517 BS-15	IC LC 3517 BS-15	IC205	C3
45 036 00	IC LC 3517 B-15	IC LC 3517 B-15	IC205	C0
60 358 00	IC M 50930-123 FP	IC M 50930-123 FP	IC206	D6
24 151 00	IC LA 6458 DF	IC LA 6458 DF	IC207	A9
60 359 00	IC UPC 4570 HA	IC UPC 4570 HA	IC208	B0
60 360 00	IC L 78 M 05	IC L 78 M 05	IC212	B2
60 361 00	IC TA 79 L 006 P	IC TA 79 L 006 P	IC213	B0
48 408 00	IC LC 7860 N	IC LC 7860 N	IC202	D4
48 411 00	IC NJM 2068 S-D	IC NJM 2068 S-D	IC07-08	A9
60 362 00	IC UM 6116 K-2	IC UM 6116 K-2	IC205	C7
60 363 00	IC BA 178 M05	IC BA 178 M05	IC212	B2
65 797 00	Transistor 2 SC 536-G	Transistor 2 SC 536-G	Q01, 13	A3
48 415 00	Transistor 2 SC 3400	Transistor 2 SC 3400	Q204 . . .	A2
40 366 00	Transistor 2 SD 1012 FG	Transistor 2 SD 1012 FG	Q205 . . .	A3
21 312 00	Transistor 2 SA 608-F-NP	Transistor 2 SA 608-F-NP	Q14-16	A4
61 267 00	Transistor JC 501	Transistor JC 501	Q201	B6
60 365 00	Transistor JA 101	Transistor JA 101	Q14-16	A3
48 418 00	Diode SVC 211 SP	Diode SVC 211 SP	D201	A8
60 366 00	Diode GMA 01-BT	Diode GMA 01-BT	D02-13	A2
26 555 00	Diode DS 442-BT	Diode DS 442-BT	D203...	A1
60 370 00	Diode ERA 15-02	Diode ERA 15-02	D26-29	A3
06 874 00	Zenerdiode ZPD 7,5	Zenerdiode ZPD 7.5	D230	B0
60 372 00	Trimmpoti 10 kOhm	Semifixed resistor 10 kOhm	P202	A4
60 373 00	Trimmpoti 20 kOhm	Semifixed resistor 20 kOhm	P204	A4
60 374 00	Trimmpoti 100 kOhm	Semifixed resistor 100 kOhm	P206	A4
60 375 00	Widerstandsnetzwerk 10 kOhm x 4	Resistor 10 kOhm x 4	RB201	A2
60 376 00	Sicherungswiderstand 10 kOhm/¼W	Fuse resistor 10 kOhm/¼W	R304	A3
60 377 00	Sicherungswiderstand 10 Ohm/½W	Fuse resistor 10 Ohm/½W	R305	A4
60 378 00	Oszillator	Oscillator coil	T202	B0
60 379 00	Filter	Filter	T203	B3
60 381 00	Quarz 8,6436 MHz	Crystal 8.6436 MHz	X201	B4
60 380 00	Schwingkreis Keramik 4,32 MHz	Ceramic asc. 4.32 MHz	X202	B0
01 436 00	Sicherung 0,5 A/250 V	Fuse 0.5 A/250 V		A2
60 788 00	Display CD	Display CD	93	D2
60 244 00	Lampe Display 110 mA/10 V	Lamp display 110 mA/10 V		A6

Abgleichanweisung CD Spieler

Benötigte Meßgeräte:
- Frequenzzähler
- Test CD Philips 5A oder Sony YEDS 18
- Oszilloskop
- DC Voltmeter

Frequenzabgleich
(Dieser Abgleich kann ohne CD-Platte durchgeführt werden.)
1. Gerät einschalten (Stop).
2. Testpunkt DSP mit Masse verbinden.
3. Kondensator C240 mit Masse verbinden (siehe Bild "Abgleichpunkte").
4. Frequenzzähler an Stecker CN 11-1 und Masse anschließen.
5. Mit Spule T202 auf 4,3218 MHz ±30 kHz abgleichen.
6. Kurzschlußbrücke entfernen.

EF-Balance-Abgleich
1. CD-Platte einlegen und Play-Taste drücken.
2. Oszilloskop an Testpunkt CN 10-3 (HF) und Masse anschließen.
3. HF-Signal mit P203 auf Maximum abgleichen **(ca 2,8 Vss mit Test CD Philips 5A und 2,7 Vss mit Test CD Sony YEDS 18).**

Fokus-Servo-Abgleich
(Einstellung von Fokus und Spurführungsverstärkung P202, P204, P206).
Für genauen Abgleich ist ein Servo-Analysator erforderlich. Jedoch besteht bei Normalbetrieb auch dann keine Schwierigkeit, wenn eine geringe Abweichung von den zulässigen Werten auftritt, da die Verstärkung in einem gewissen Bereich variieren kann. Deswegen sollte dieser Abgleich nicht ausgeführt werden. Mit der Fokus- und Servoverstärkung werden Nachführeigenschaften des Abtasters bei mechanischen Erschütterungen und Stößen während des Betriebs beeinflußt.

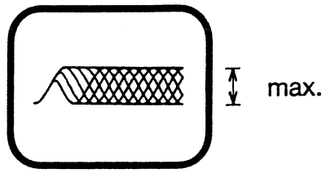
Antriebstellerhöhe
Diese Einstellung ist notwendig, wenn der Antriebstellermotor gewechselt wird.
Der Antriebsteller muß so befestigt werden, daß der Abstand zwischen Oberkante Teller und Chassis 14,05 mm ±0,1 mm beträgt.

Alignment procedure CD player

Instruments required:
- Frequency counter
- Test disk Philips 5A or test disk Sony YEDS 18
- Oscilloscope
- DC voltmeter

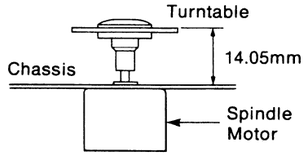
VCO frequency adjustment
(This adjustment does not need a compact disk.)
1. Set the unit power ON, STOP mode.
2. Connect test point DSP to ground.
3. Connect capacitor C240 to ground (see picture "alignment points").
4. Connect frequency counter to socket CN 11-1 and ground.
5. Adjust T202 so that the value of the frequency counter comes within 4.3218 MHz ±30kHz.
6. Disconnect DSP and ground.

EF-Balance adjustment
1. Load a disk and play back.
2. Connect an oscilloscope to test point CN 10-3 (HF) and ground.
3. Adjust P203 so that the HF-Signal becomes maximum **(about 2.8 Vpp with test disk Philips 5A and 2.7 Vpp with test disk Sony YEDS 18).**



Focus servo gain adjustment
(Focus/Tracking-gain adjustment P202, P204, P206).
A servo-analyzer is required for accurate adjustment.
However, there will be no problem in normal operation even in case of a minor drift from precise adjustment because the gain has an allowable margin.
Therefore, do not apply this adjustment.
The Focus/Tracking-gain determines the tracking property of the pick-up against the mechanical noise and mechanical shock during the operation.

Adjustment of turntable height
This adjustment must be performed when the spindle motor is replaced.
The turntable should be mounted so that its upper surface is 14.05 mm ±0.1 mm above the surface of the chassis.



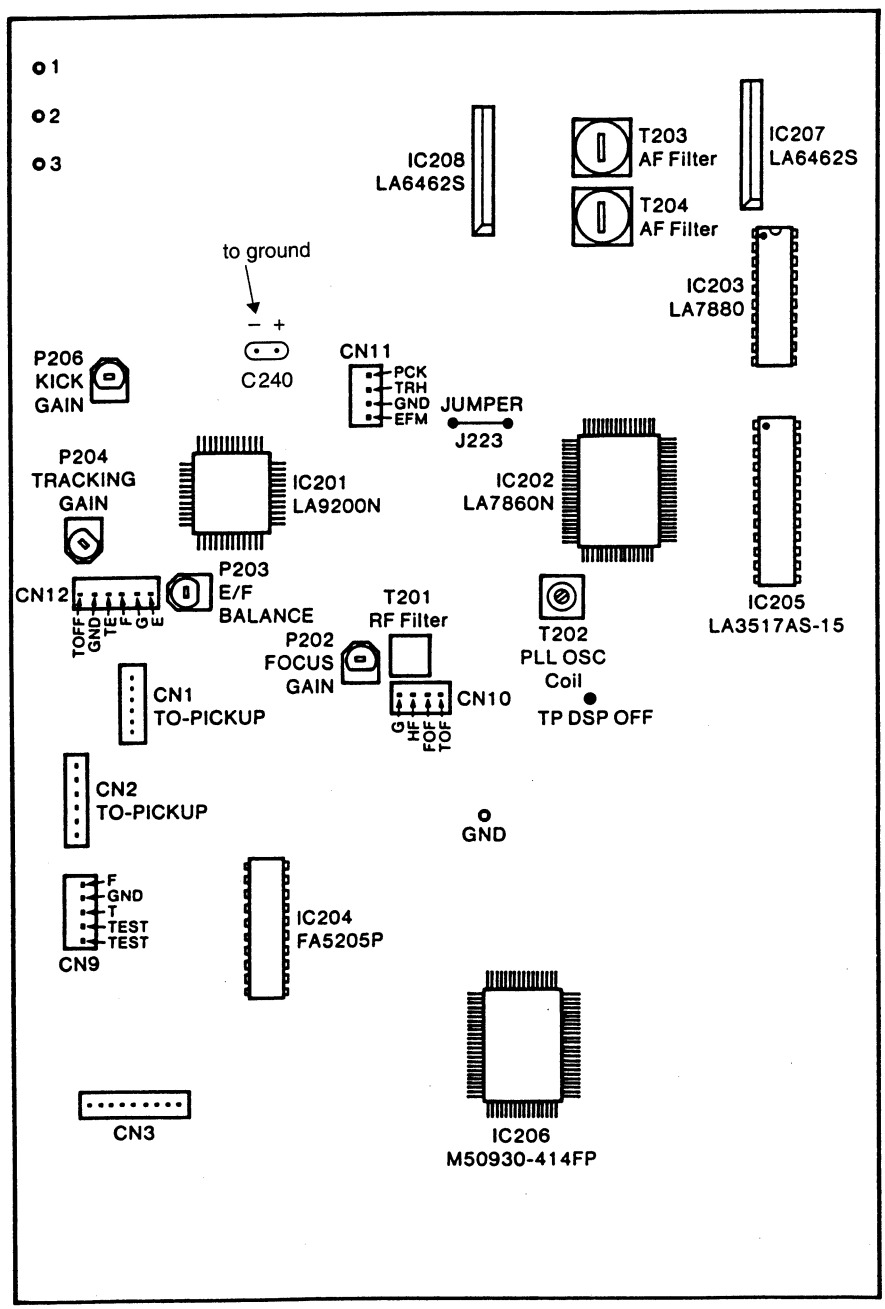
Kontrolle Fokusabweichung
1. Gerät einschalten (Stop).
2. Testpunkt CN 10-2 (FOF) und Masse verbinden.
3. DC Voltmeter zwischen CN 9-5 (F) und Masse anschließen.
4. Kontrollieren, ob die Spannung zwischen -0,7 V und -1,2 V liegt.
5. Kurzschlußbrücke entfernen.

Kontrolle Spurabweichung
1. Gerät einschalten (Stop).
2. Testpunkt CN 10-1 (TOF) mit Masse verbinden.
3. DC Voltmeter zwischen CN 9-3 (T) und Masse anschließen.
4. Kontrollieren, ob die Spannung zwischen +50 mV und +250 mV liegt.
5. Kurzschlußbrücke entfernen.

Focus offset control
1. Set the unit power ON, STOP mode.
2. Connect test point 10-2 (FOF) and ground.
3. Connect a DC voltmeter between CN 9-5 (F) and ground.
4. Check that the DC voltmeter Indicator is in the range -0.7 V and -1.2 V.
5. Disconnect FOF and ground.

Tracking offset control
1. Set the unit power On, STOP mode.
2. Connect test point CN 10-1 (TOF) and ground.
3. Connect a DC voltmeter between CN 9-3 and ground.
4. Check that the DC voltmeter Indicator is in the range +50 mV and +250 mV.
5. Disconnect TOF and ground.

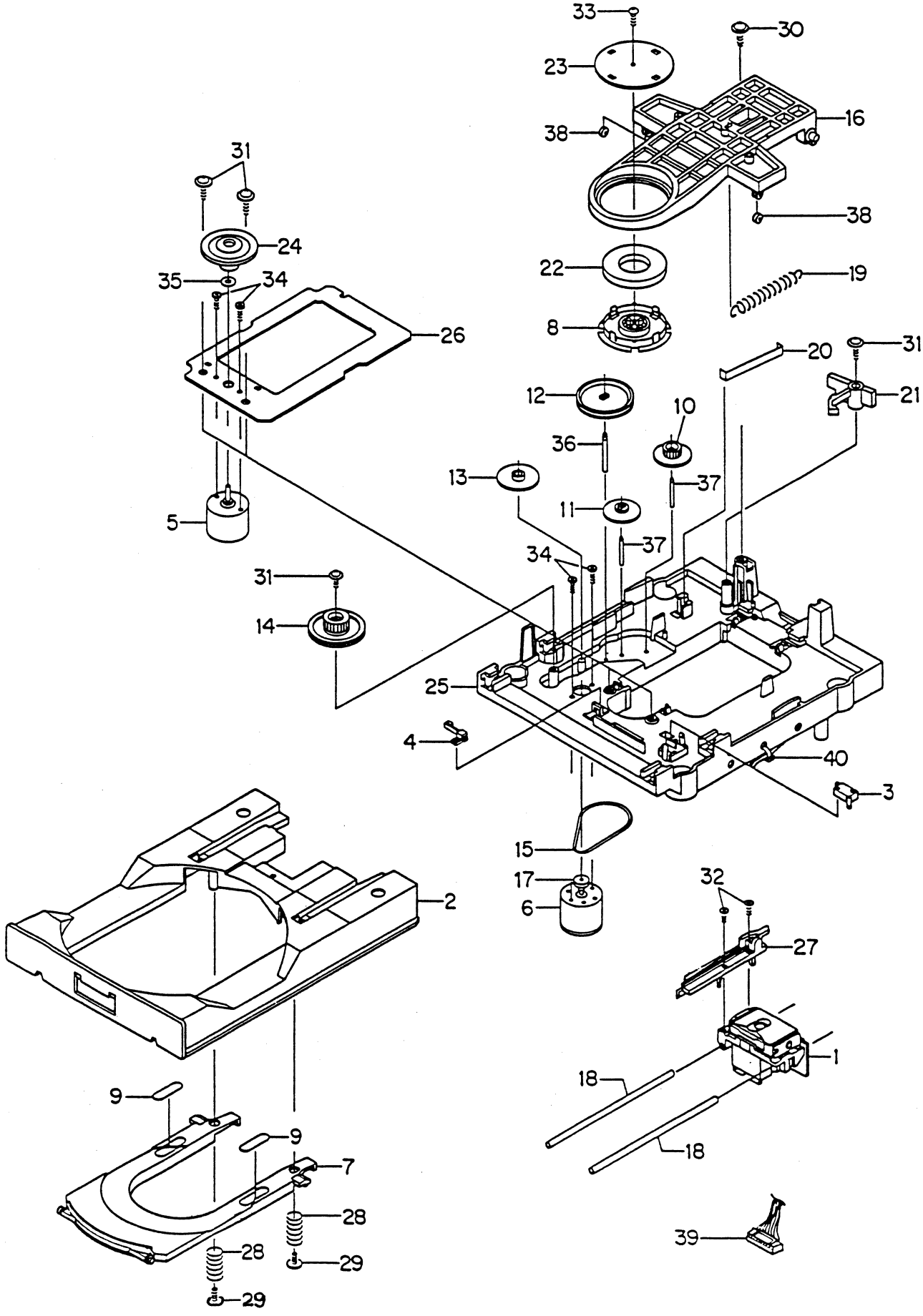
Abgleichpunkte
Alignment points



Explosionsdarstellung CD Mechanik

Exploded view CD mechanism

CD . . .



Ersatzteilliste CD Mechanik
Spare parts list CD mechanism

Bestell-Nr./ Part. No.	Bezeichnung	Description	Position	Preisgruppe/ Price key
70 056 00	CD Mechanik kpl. CD 91F7	CD mechanism assembly	77	F5
60 335 00	Laserabtaster	Assembly pick up laser	CD 1	F1
66 142 00	Schlitten kpl.	Table loading assembly	CD 2+7 +9+28+29	D1
60 336 00	Schalter (Hebel)	Lever switch 1PIT	CD 3	A8
66 143 00	Mikroschalter	Leaf switch	CD 4	A4
60 339 00	Motor Disk	Motor	CD 5	C6
66 144 00	Motor Laser + Schlitten	Motor	CD 6	C3
66 145 00	Niederhalter kpl.	Flap disc cramp assembly	CD 8+16+22 +23+33+38	D2
66 146 00	Zahnrad Laser	Gear pinion pick	CD 10	A4
66 147 00	Zahnrad laden Laser	Gear load pick	CD 11	A4
66 148 00	Zahnrad Pulley	Gear pulley	CD 12	A4
66 149 00	Zahnrad laden Schlitten	Gear load table	CD 13	A6
66 150 00	Zahnrad Schlitten	Gear pinion table	CD 14	A6
66 151 00	Antriebsriemen	Belt square	CD 15	A6
66 152 00	Pulley-Motor	Pulley motor	CD 17	A4
66 153 00	Gleitstange Laser	Shaft slide pick	CD 18	A8
66 154 00	Feder Rasthebel Laser	Spring tens flap	CD 19	A5
66 156 00	Schalterhebel	Arm change	CD 21	A4
60 340 00	Antriebsteller	Turntable assembly	CD 24	B3
66 158 00	Zahnstange Laser	Gear rack	CD 27	A6

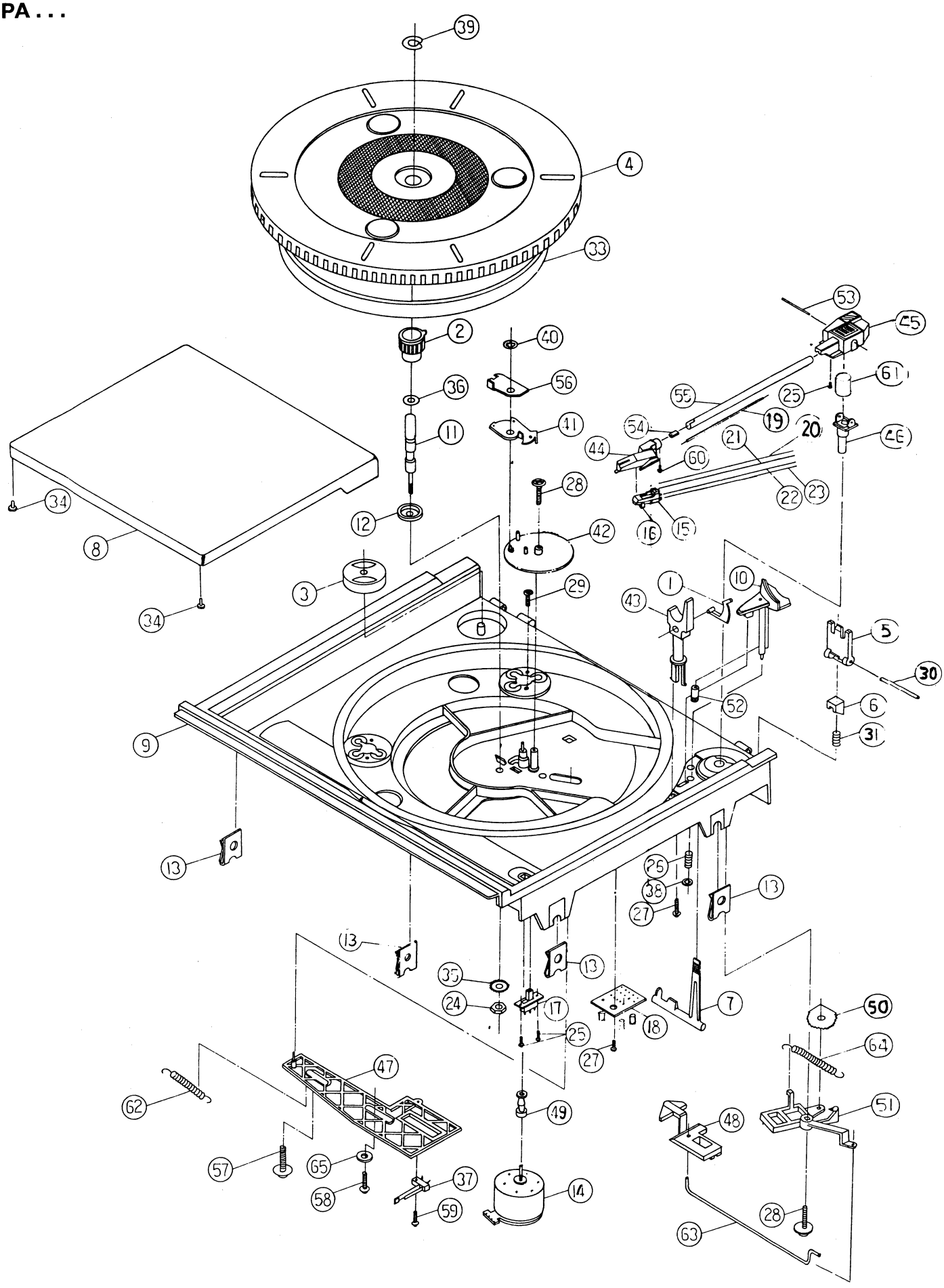
Ersatzteilliste Cassettenmechanik
Spare parts list cassette mechanism

Bestell-Nr./ Part. No.	Bezeichnung	Description	Position	Preisgruppe/ Price key
60 328 00	Cassettenmechanik kpl.	Deck TN 21 ZSW-657	27	F7
29 048 00	Schiebeschalter A/W	Recording switch	SW 351	B0
44 128 00	Feder Pauserasthebel	P control spring	CM 10	A0
46 417 00	Pauserasthebel	Pause lever (E)	CM 11	A0
44 130 00	Druckfeder Pauserasthebel	Pause lever spring	CM 12	A0
44 131 00	Sicherungsstöpsel Pause	Pause stopper	CM 13	A2
32 428 00	Feder Tastenhebel (Vor-, Rücklauf)	Button lever spring (A)	CM 14	A3
32 423 00	Feder Tastenhebel (Stop, Pause)	Button lever spring (B)	CM 22	A3
44 132 00	Mikroschalter MSW-1541 T	Leaf switch MSW-1541 T	CM 23	A4
44 133 00	Mikroschalter MSW-17820 MKDO	Leaf switch MSW-17820 MKDO	CM 24	A7
45 760 00	Feder Kopfträgerplatte	Panel P spring	CM 29	A2
48 203 00	Feder Bandandruckrolle	M control spring	CM 30	A1
44 134 00	Bandandruckrolle kpl.	Pinch roller arm assembly	CM 35	A2
44 135 00	Tasthebel Endabschaltung	Sensing lever	CM 38	A6
44 137 00	Rutschkupplung kpl.	RF clutch assembly	CM 39	A7
44 138 00	Riemen Rutschkupplung	RF belt	CM 40	B3
46 866 00	Schwungmasse A/W Laufwerk	Flywheel assembly	CM 43	B7
46 865 00	SchwungmasseWiedergabeLaufwerk	Flywheel assembly	CM 44	B7
66 085 00	Feder	Gear plate spring	CM 45	A3
44 136 00	Kurvenzahnrad	Cam gear	CM 47	A6
32 447 00	Zahnrad Vorlauf	FF gear	CM 49	A5
44 319 00	Feder Wickelteller links	Back tension spring	CM 50	A0
44 141 00	Wickelteller links	Supply reel assembly	CM 51	A8
60 329 00	Wickelteller rechts	Take up reel assembly	CM 52	B2
44 778 00	Pulley-Motor	Moter pulley	CM 58	A6
60 330 00	Antriebsriemen	Main belt	CM 59	A3
44 144 00	Gleithebel Eject	Eject slide lever	CM 62	A2
32 459 00	Cassettenandruckfeder	Pack spring	CM 64	A5
60 331 00	Wiedergabekopf MS 15P-ACON1	P. head	CM 65	B8
60 332 00	A/W-Kopf MS 15R-AA 2 N1	R. P. head	CM 66	B8
60 333 00	Löschkopf LE 17 AC 1	E. head	CM 67	B4
46 177 00	Antriebsmotor SHU 2 L	Motor SHU 2 L	CM 68	C6
32 451 00	Aufnahmesperrhebel	Rec. safety lever	CM 69	A5

Explosionsdarstellung Plattenspieler

Exploded view record player

PA . . .



Ersatzteilliste Plattenspieler

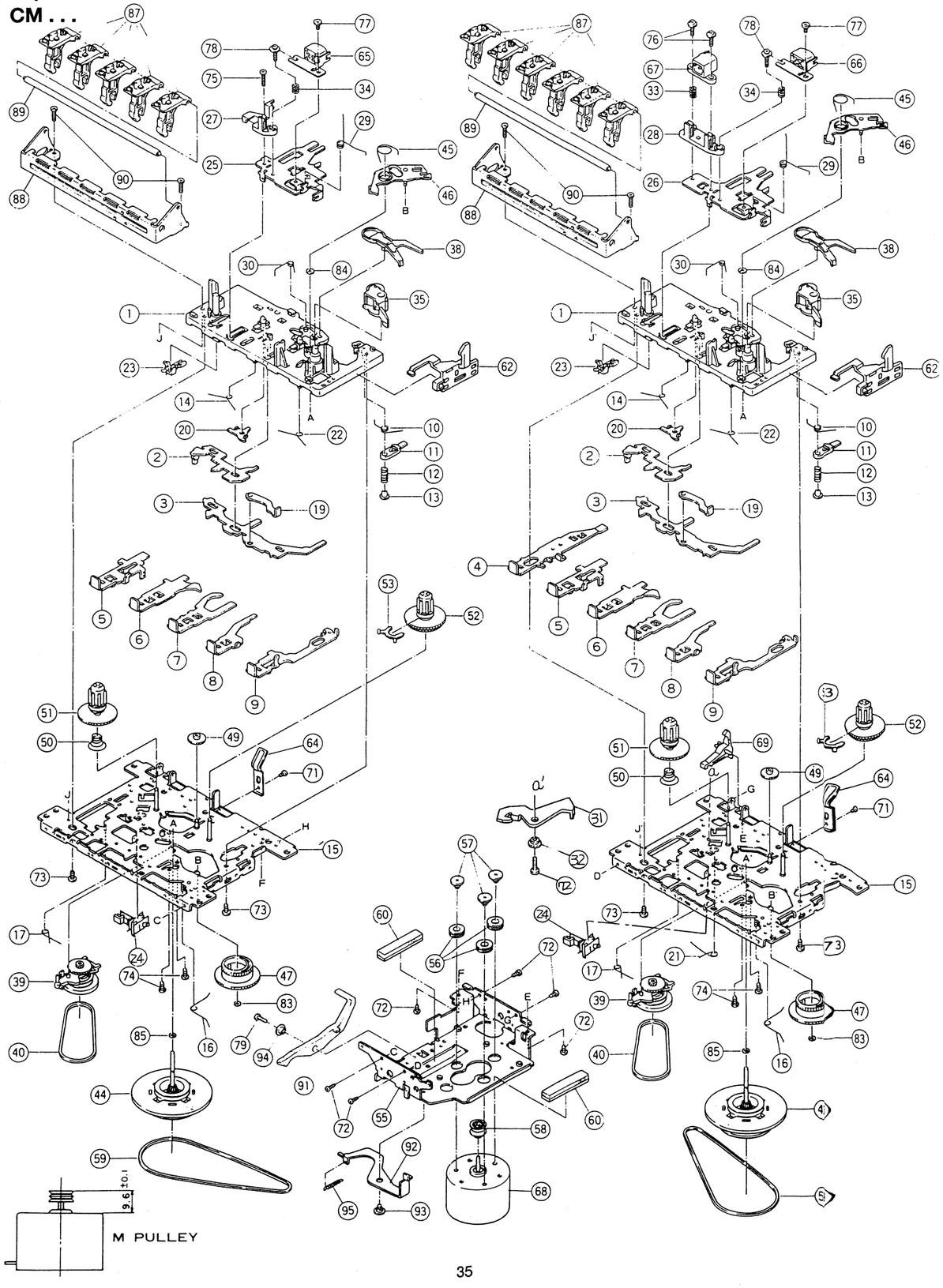
Spare parts list record player

Bestell-Nr./ Part. No.	Bezeichnung	Description	Position	Preisgruppe/ Price key
70 057 00	Plattenspieler kpl.	Record player assembly	100	F0
60 308 00	Zarge, Gehäuseoberteil	Base	PA 9	D2
34 355 00	Puck	45 RPM adapter	PA 3	A2
60 309 00	Plattenteller kpl.	Platter assembly	PA 2+4	C3
60 993 00	Gummimatte	Rubber mat		B6
34 371 00	Antriebsriemen	Belt	PA 33	B0
60 310 00	Achse Plattenteller	Platter shaft	PA 11	B0
60 311 00	Kurvenzahnrad kpl.	Cam gear assembly	42+..	B0
70 065 00	Tonarm kpl.	Tonearm ass'y	PA 55+	D1
60 314 00	Tonarmstütze	Tonearm rest	PA 43	A2
60 315 00	Clip Tonarmstütze	Tonearm clip	PA 1	A1
60 316 00	Lift	Lifter	PA 10	A3
48 922 00	Hebel Lift	Cueing clip	PA 7	A3
60 317 00	Feder Lift	Spring	PA 26	A1
37 874 00	Schalter 45-33	Switch for speed	PA 17	A3
70 066 00	Antriebsmotor (6T2 RWKO)	Motor (6T2 RWKO)	PA 14	C5
60 319 00	Pulley-Motor	Pulley	PA 49	A1
60 320 00	Mikroschalter (Ein/Aus)	Switch	PA 37	A7
60 321 00	Haupthebel	Operating plate	PA 47	A3
60 322 00	Feder Haupthebel	Spring	PA 62	A3
65 118 00	Zahnrad, Endschalthebel	Control cam ring	PA 50	A1
60 323 00	Endschalthebel	Control lever	PA 51	A2
60 324 00	Feder Endschalthebel	Spring	PA 64	A1
60 325 00	Endschaltstange	Pendulum	PA 63	A3
60 326 00	Schalthebel	Trip lever	PA 48	A1
14 142 00	Sprengring	E-Ring	PA 39	A1
70 058 00	Magnetsystem	Cartridge	PA 15	C8
70 059 00	Abtastnadel	Stylus	PA 16	B9

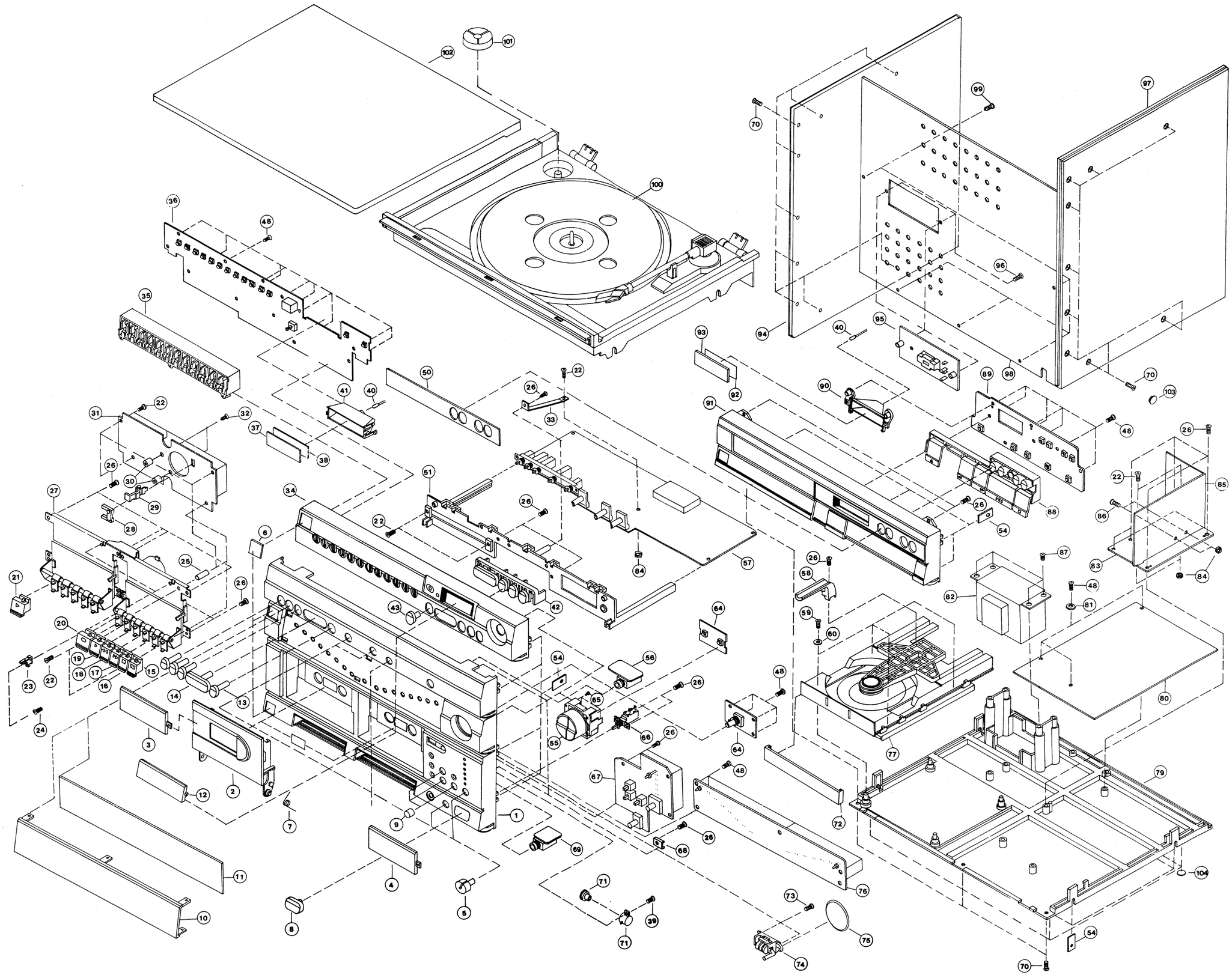
Explosionsdarstellung Cassettenmechanik TN 21 ZSW-657

Exploded view cassette mechanism

CM . . .



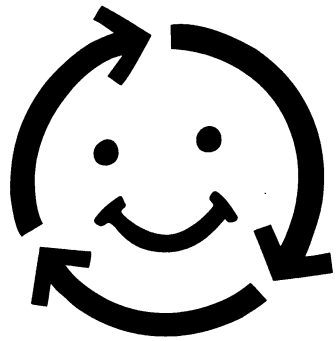
Explosionsdarstellung Gehäuse
Exploded view housing



Ersatzteilliste Gehäuse
Spare parts list housing

Bestell-Nr./ Part. No.	Bezeichnung	Description	Position	Preisgruppe/ Price key
70 033 00	Fernbedienungsgeber SPP 93	Remote control		D9
70 034 00	Frontblende SPP 93 Cassette, Verstärker	Main escut	1	C3
60 292 00	Frontblende SPP 93 Tuner	Digital escut	34+12	C0
60 236 00	Frontblende SPP 93 CD	CD escut	91	C1
60 237 00	Seitenteil links	Main cabinet (left)	94	C1
60 238 00	Seitenteil rechts	Main cabinet (right)	97	C1
70 035 00	Gehäuserückwand	Main cabinet (back)	98	B5
70 036 00	Gehäuseboden	Cabinet base	79	C2
65 345 00	Abdeckung f. Schraube	Shade button	103	A0
66 555 00	Abdeckhaube	Dust cover	102	C7
60 327 00	Haubenscharnier kpl.	Hinge assembly	PA5+	A4
70 037 00	„Schneider"-Emblem	Name plate	6	A2
60 293 00	Preset-Tastenleiste 12fach	Pre-set knob	35	C0
60 294 00	Tasten Tuner 4fach	Digital key knob	42	A4
60 295 00	Taste Mono/Stereo	Push button knob (mono)	43	A1
60 246 00	Cassettenfach A	Cassette door A	2	B0
60 247 00	Cassettenfach B	Cassette door B	2	B0
60 248 00	Cassettenfachfenster	Cassette door lens	3, 4	A9
60 266 00	Feder Cassettenfach	Cassette door spring	7	A3
60 257 00	Knopf HSD	High speed dubbing knob	9	A2
60 253 00	Klaviertaste Cassette Pause	Cassette knob (Pause)	15	A3
60 252 00	Klaviertaste Cassette Stop	Cassette knob (Stop)	16	A3
60 251 00	Klaviertaste Cassette Forward	Cassette knob (Forward)	17	A3
60 250 00	Klaviertaste Cassette Rewind	Cassette knob (Rewind)	18	A3
60 255 00	Klaviertaste Cassette Play (schmal)	Cassette knob (S) (Play)	19	A3
60 254 00	Klaviertaste Cassette Record	Cassette knob (L) (Record)	20	A3
60 249 00	Klaviertaste Cassette Play (breit)	Cassette knob (L) (Play)	21	A3
48 372 00	Mikroschalter Bandsorte MSW-1664	Leaf switch MSW-1664	23	A6
60 390 00	Aufnahme Schalthebel-Halter	Record lever holder	28	A3
60 391 00	Aufnahme Schalthebel	Record lever	29	A2
60 392 00	Cassettenfachdämpfung	Gear damper	71	A6
60 258 00	Zählwerk	Counter	74	B3
60 259 00	Riemen Zählwerk	Counter belt	75	A3
60 262 00	Blende Powermeter	LED lens	10	B4
60 263 00	Drehknopf Bal/Bass/Treble/Micro/Record	Balance/Bass/Treble knob	5	A3
60 256 00	Knopf Netzschalter	Power knob	8	A3
60 264 00	Taste Betriebsart schmal (4)	Push button knob (S)	13	A2
60 265 00	Taste Betriebsart breit (1)	Push button knob (L)	14	A3
60 393 00	Knopf Lautstärke/Tuning	Volume up/down knob	55	A6
60 267 00	Schlittenblende CD	CD door cover	72	A6
60 268 00	Tastenleiste CD 9fach	CD control knob	88	A7
70 038 00	Buchsenplatte Rückwand	Back panel	95	A9

Der Umwelt zuliebe!



Diese Serviceanweisung
wurde auf chlorfrei gebleichtem
Papier gedruckt.

Bitte bei Ersatzteilbestellung die genaue Bezeichnung und **Ident-Nr. (siehe Typenschild)** des Gerätes sowie Bestell-Nummer und Positions-Nummer des Ersatzteils angeben.

For ordering of spare parts please state exact description and **ident no. of unit (see silver rating label on the backside of unit)** as well as part no. and position no. of required spare parts.

Benutzen Sie:

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oder

Telefax: 08245/51326

Technische Änderungen vorbehalten.
Technical modifications reserved.

Zusatz zur Serviceanweisung

Ident-Nr. 68 670
Ident-Nr. 68 671
Ident-Nr. 68 797

Additional service manual

SPP 93
SPP 93.10

Achtung!

Diese Serviceanweisung ist **zusätzlich zur Serviceanweisung SPP 93 zu verwenden,** wenn es sich um Geräte mit oben genannter Ident-Nr. handelt.

Diese Geräte enthalten neue CD-Platinen.

Für alle anderen benötigten Unterlagen verwenden Sie bitte die Serviceanweisung SPP 93 für die Ident-Nr. 49 958.

Attention!

This service manual is **additional to the service manual SPP 93** if you handle units with the above mentioned ident-no.

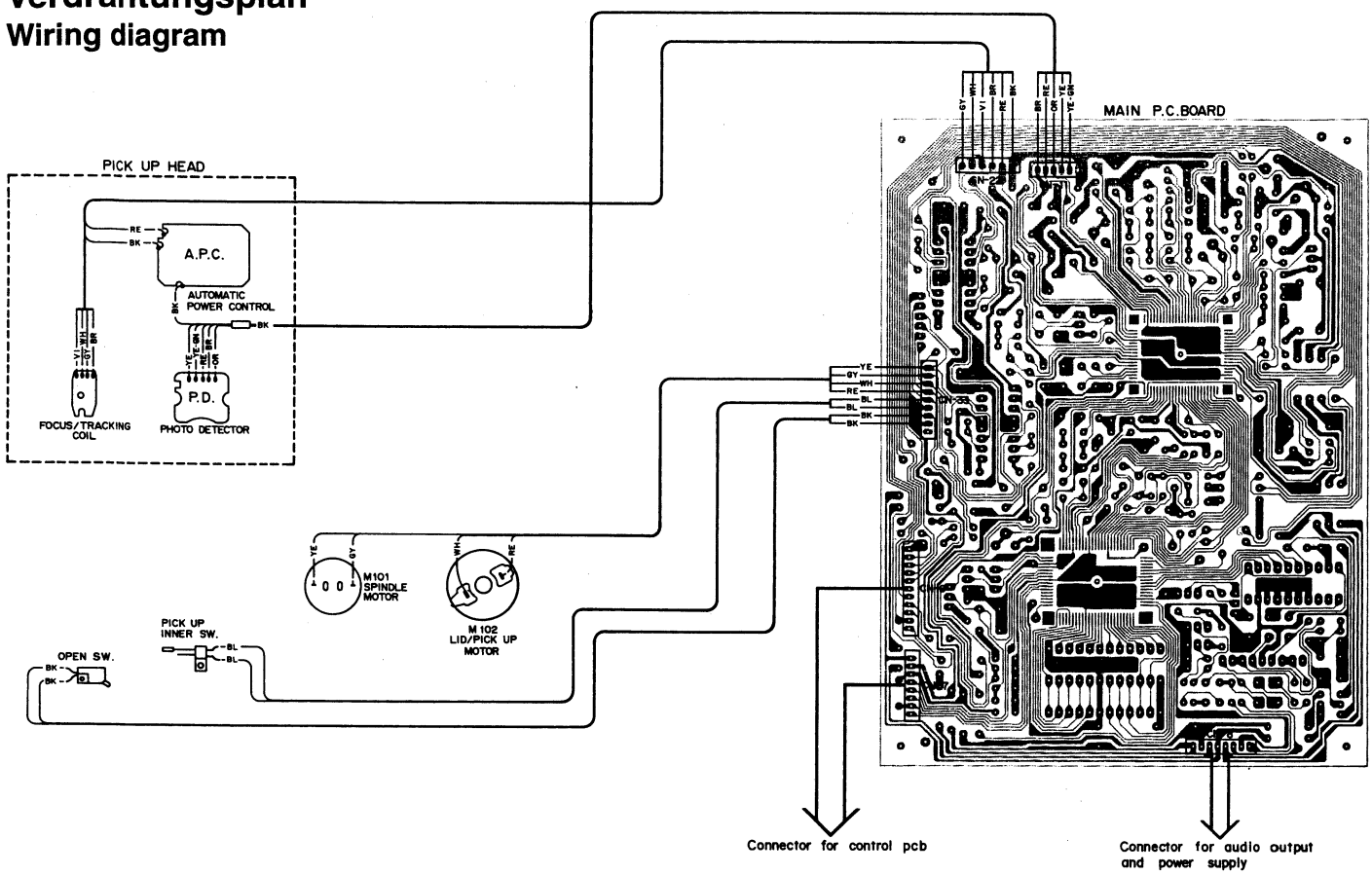
These units contain new CD PCB's.

For all other documents needed use the service manual SPP 93 for ident-no 49 958.

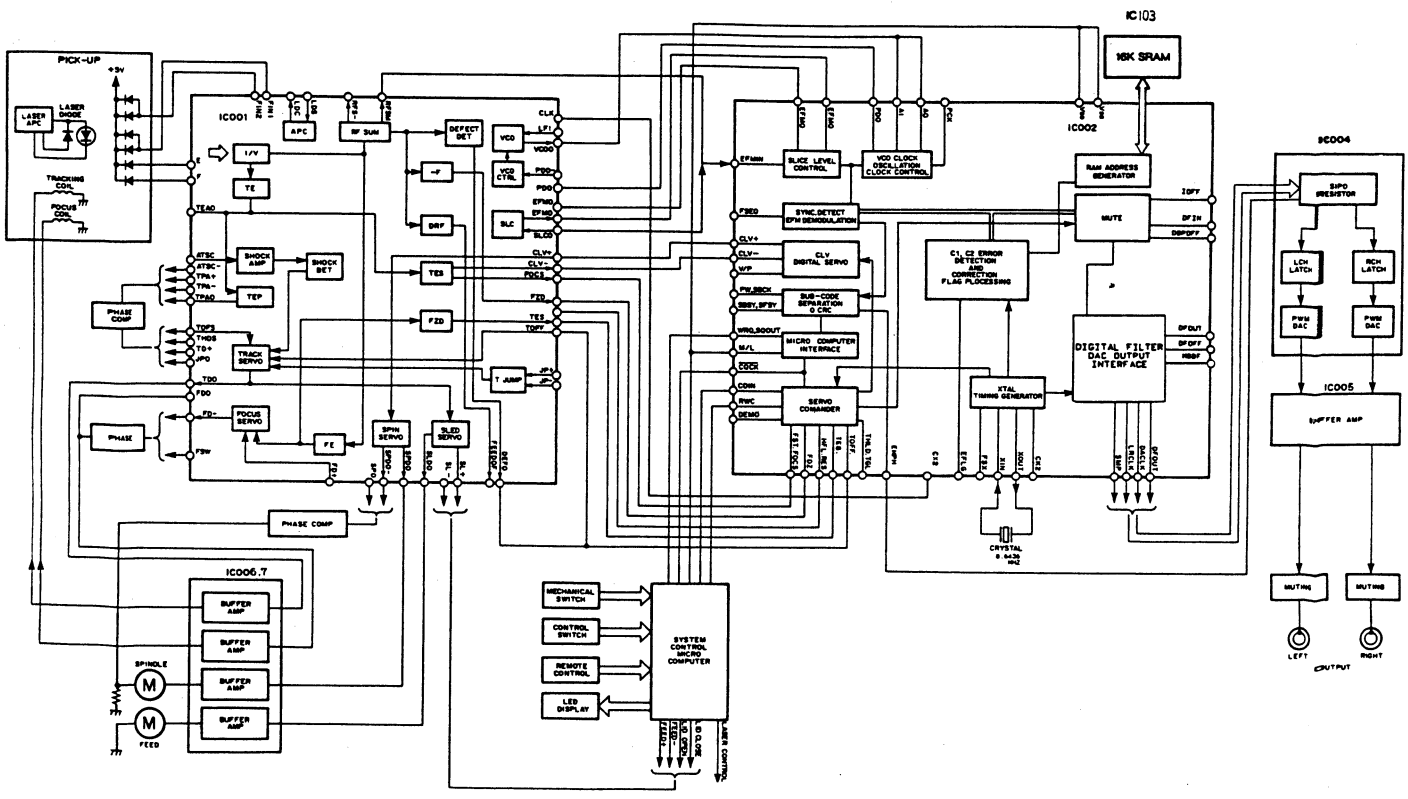
Diese Service-Unterlage wurde ausschließlich für autorisiertes Fachpersonal erstellt.
Für Eingriffe durch nicht autorisierte Personen übernimmt der Hersteller keine Haftung.

This service manual was only made for authorized specialists.
For interventions by not authorized persons producer doesn't take possession of liability.

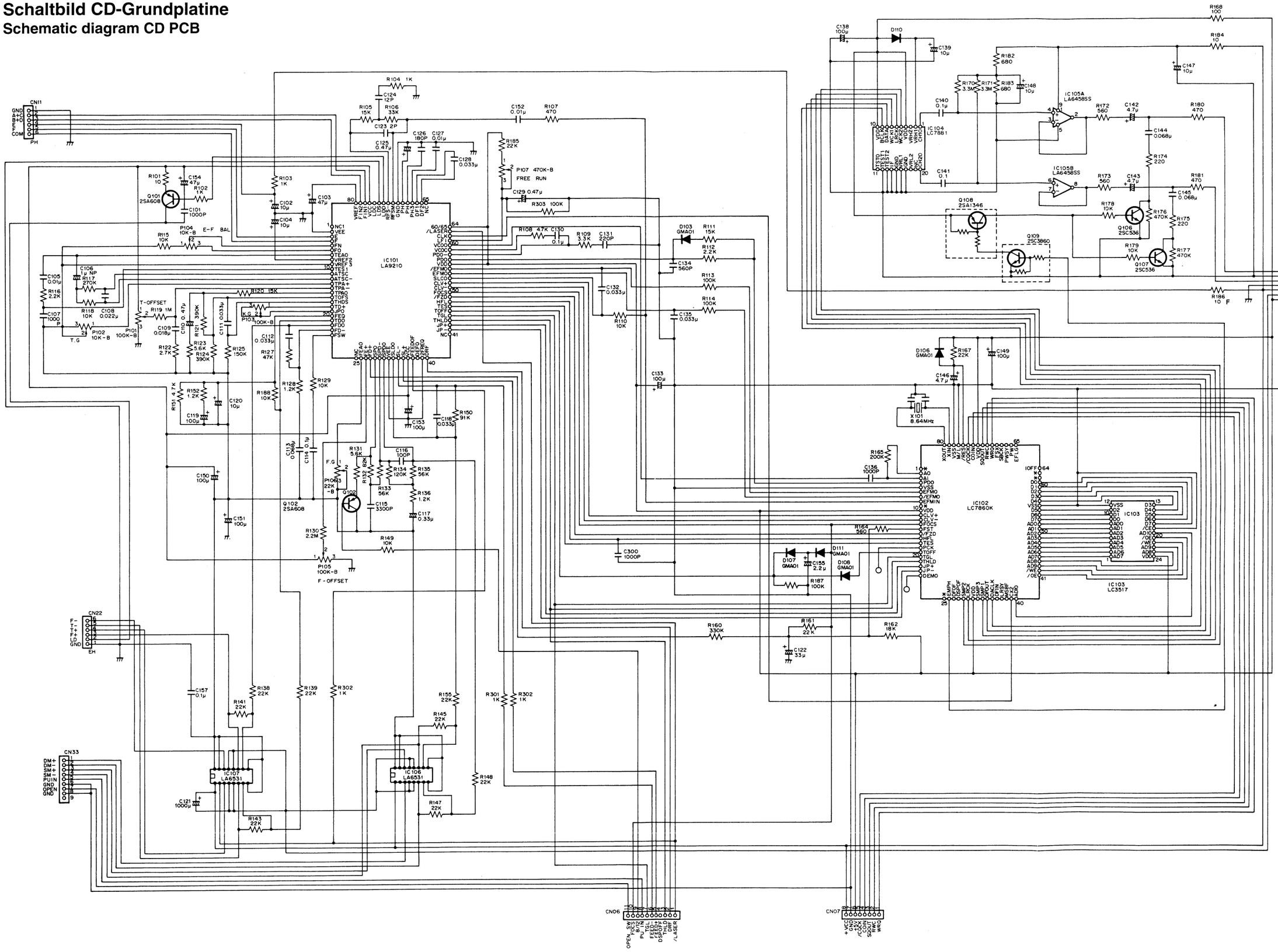
Verdrahtungsplan
Wiring diagram



Blockschaltplan
Function block diagram

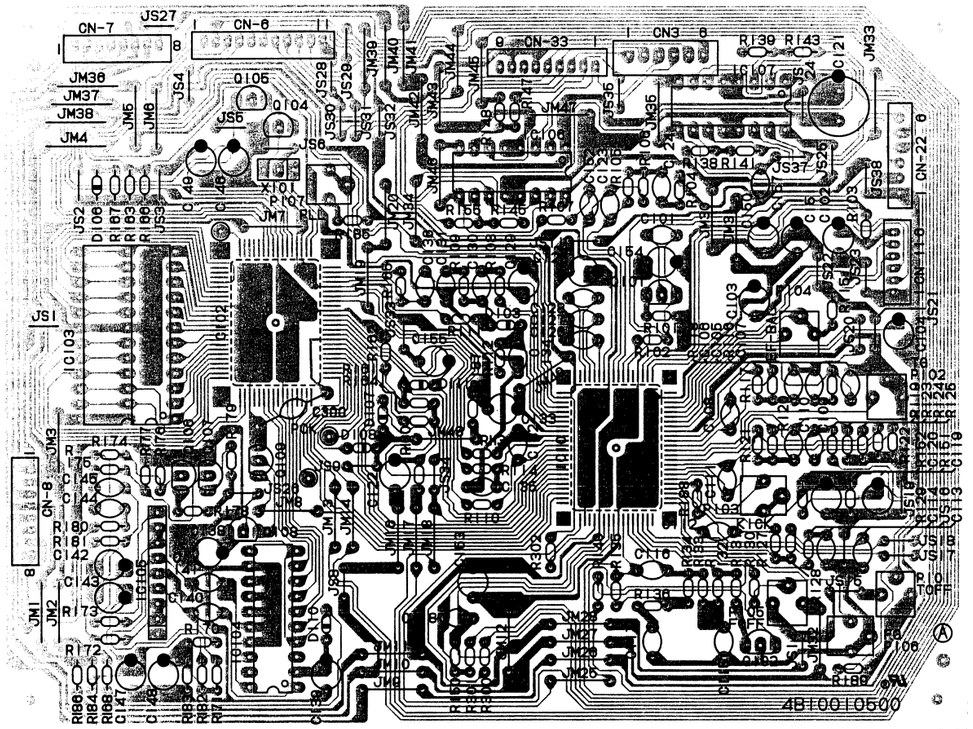


Schaltbild CD-Grundplatine
Schematic diagram CD PCB



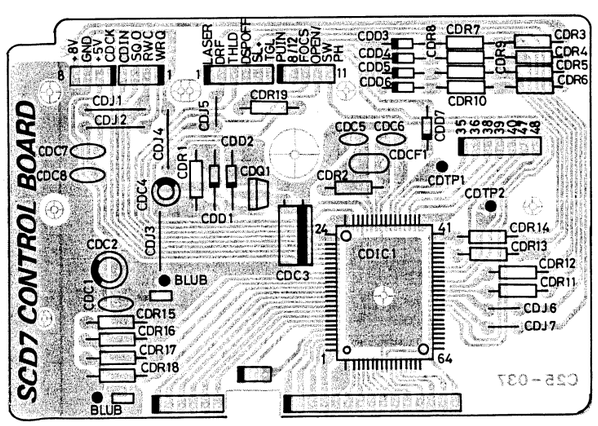
Platinendarstellung Grundplatine CD
CD main PCB diagram

Bestückungsseite / Top side

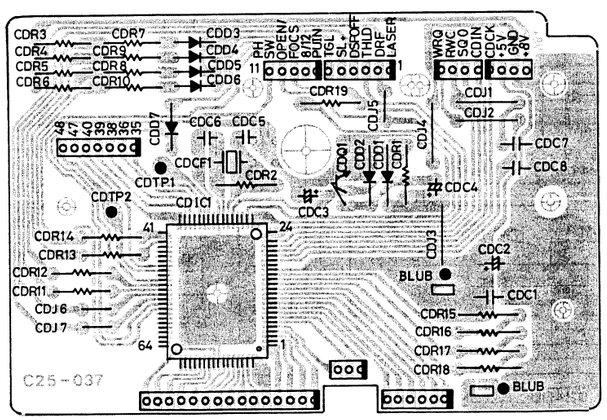


Platinendarstellung CD-Kontrollplatine
CD control DCB diagram

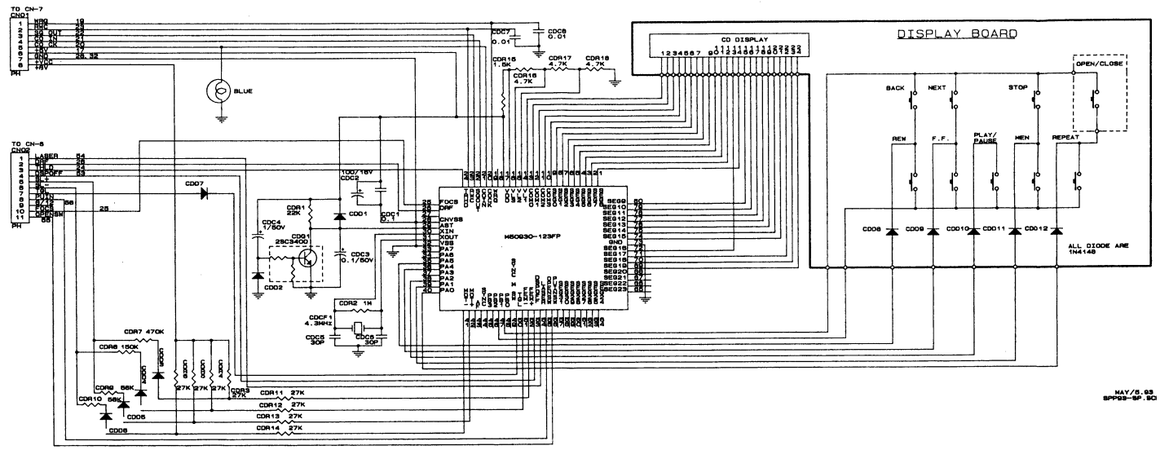
Bestückungsseite/
Top side



Leiterbahnseite/
Solder side

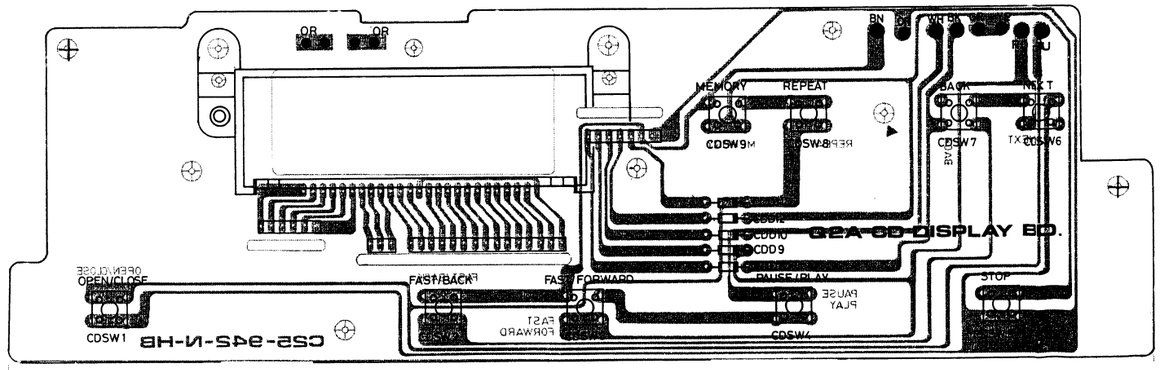


Schaltplan CD-Kontrollplatine
Schematic diagram CD control PCB



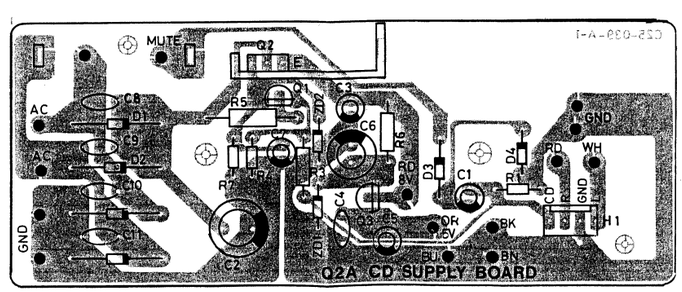
Platinendarstellung Bedienteilplatine CD
CD display PCB diagram

Bestückungsseite/
Top side

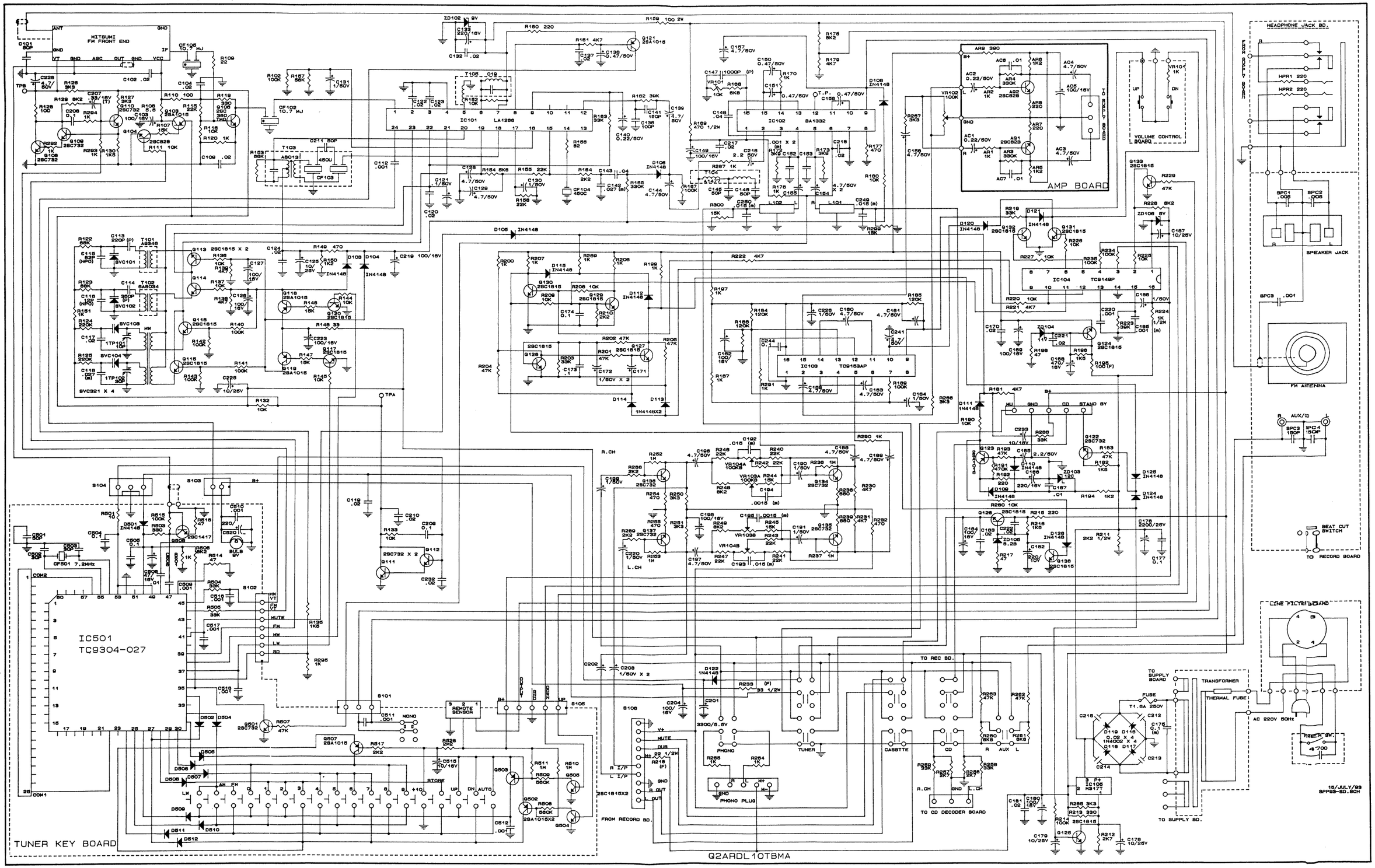


Platinendarstellung CD-Spannungsversorgung
CD supply PCB diagram

Bestückungsseite/
Top side



Schaltbild Grundplatine Gerät
Schematic diagram main PCB unit



Spannungstabelle CD
Voltage tables CD

PIN NO.	IC101 LA9210	PIN NO.	IC 101 LA9210	PIN NO.	IC 102 LC7860K	PIN NO.	IC 102 LC7860K	PIN NO.	IC 103 LC3517	IC 104 LC7881	IC 105 LA6458S	IC 106 LA6531	IC 107 LA6531
1	0	35	3.6	1	0	35	2.5	1	2.3	2.0	7.8	7.9	7.9
2	0	36	7.3	2	2.4	36	0	2	2.3	4.0	4.0	4.0	4.3
3	3.5	37	4.0	3	2.4	37	0	3	2.3	4.0	4.0	0	0
4	3.5	38	3.5	4	2.4	38	0	4	2.3	4.6	2.4	0	0
5	3.5	39	3.5	5	0	39	0	5	1.5	1.0	-0.9	0	0
6	3.5	40	0	6	2.4	40	2.3	6	1.5	2.6	2.4	3.9	0
7	4.0	41	0.5	7	0.8	41	3.4	7	1.5	2.4	4.0	3.9	2.0
8	3.5	42	0	8	2.5	42	0	8	1.5	0	4.0	3.9	3.9
9	3.5	43	0	9	0	43	2.3	9	1.3	2.5	7.8	3.9	3.9
10	2.5	44	0	10	4.9	44	2.3	10	1.3	4.9		0	2.2
11	2.5	45	4.9	11	0	45	2.3	11	1.3	0		3.9	0
12	2.5	46	0	12	0.2	46	2.3	12	0	0		0	0
13	4.0	47	4.9	13	0	47	2.3	13	3.5	0		0	0
14	4.0	48	4.9	14	0	48	2.3	14	3.5	0		3.9	0
15	4.5	49	4.9	15	0	49	1.5	15	3.5	0		3.9	3.9
16	4.5	50	0	16	4.0	50	1.5	16	1.6	0		3.9	3.9
17	3.8	51	0	17	4.0	51	1.5	17	0	0			
18	3.8	52	0	18	2.2	52	1.5	18	0	0			
19	3.8	53	2.3	19	4.8	53	1.3	19	2.3	0			
20	3.8	54	1.7	20	4.8	54	1.3	20	3.4	2.0			
21	3.8	55	1.7	21	0	55	1.3	21	0				
22	3.8	56	5.0	22	0	56	0	22	2.3				
23	3.8	57	2.5	23	0	57	3.5	23	2.3				
24	3.8	58	2.5	24	0	58	3.5	24	4.9				
25	3.0	59	2.5	25	0	59	3.5						
26	3.7	60	3.8	26	4.9	60	1.6						
27	2.5	61	2.5	27	0	61	0						
28	3.0	62	2.2	28	0	62	0						
29	3.0	63	4.5	29	1.0	63	0						
30	3.0	64	5.0	30	2.4	64	0						
31	3.0			31	4.9								
32	0			32	0								
33	3.0			33	0								
34	3.6			34	0								

TR NO.	B	C	E
Q101	6.2	3.8	6.9
Q102	3.2	3.6	3.6
Q106	0.6	0	0
Q107	0.6	0	0
Q108	0	4.6	4.6
Q109	4.8	0	0

Abgleichanweisung CD Spieler

Benötigte Meßgeräte:
- Frequenzzähler
- Test CD Philips 5A oder Sony YEDS 18
- Oszilloskop
- DC Voltmeter

Frequenzabgleich
(Dieser Abgleich kann ohne CD-Platte durchgeführt werden.)
1. CD-Schlitten öffnen.
2. Frequenzzähler an TP PCK und Masse (JM7)anschließen.
3. Mit P107 auf 4,300 MHz ±20 kHz abgleichen.

Kontrolle Fokusabweichung
1. CD-Schlitten öffnen.
2. DC Voltmeter zwischen TP FDO (C112) und Masse (JM6) anschließen.
3. Kurzschlußbrücke zwischen Masse (JM7) und JM6 und zwischen Masse (JM7) und D111 anodenseitig (TP FOC).
4. Mit P105 auf 0 V ±10 mV abgleichen.
5. Kurzschlußbrücken entfernen.

Kontrolle Spurabweichung
1. CD-Schlitten öffnen.
2. DC Voltmeter zwischen TP TDO und Masse JM30 anschließen.
3. Masse (JM7) mit JS9 verbinden.
4. Mit P101 auf 100 mV ±10 mV abgleichen.
5. Kurzschlußbrücke entfernen.

EF-Balance-Abgleich
1. CD-Platte einlegen und Play-Taste drücken.
2. Oszilloskop an TP HF (C152) und Masse (JM7) anschließen.
3. HF-Signal mit P104 auf Maximum abgleichen **(ca 2,7 Vss mit Test CD Philips 5A und 2,5 Vss mit Test CD Sony YEDS 18).**

Alignment procedure CD player

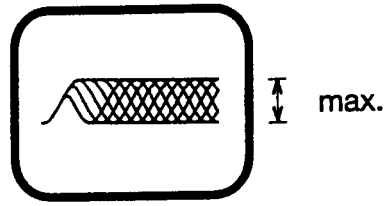
Instruments required:
- Frequency counter
- Test disk Philips 5A or test disk Sony YEDS 18
- Oscilloscope
- DC voltmeter

VCO frequency adjustment
(This adjustment does not need a compact disk.)
1. Open CD tray.
2. Connect frequency counter to TP PCK and ground (JM7).
3. Adjust P107 so that the value of the frequency counter comes within 4.300 MHz ±20 kHz.

Focus offset control
1. Open CD tray.
2. Connect a DC voltmeter between TP FDO (C112) and ground (JM6).
3. Connect ground (JM7) to JM6 and ground (JM7) to anode of D111 (TP FOC).
4. Adjust with P105 to 0 V ±10 mV.
5. Disconnect short circuits.

Tracking offset control
1. Open CD tray.
2. Connect a DC voltmeter between TP TDO and ground JM 30.
3. Connect ground (JM7) to JS9.
4. Adjust with P101 to 100 mV ±10 mV.
5. Disconnect short circuit.

EF-Balance adjustment
1. Load a disk and play back.
2. Connect an oscilloscope to TP HF (C152) and ground.
3. Adjust P104 so that the RF-Signal becomes maximum **(about 2.7 Vpp with test disk Philips 5A and 2.5 Vpp with test disk Sony YEDS 18).**

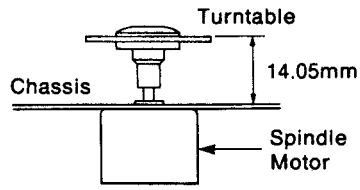


Fokus-Servo-Abgleich
(Einstellung von Fokus und Spurführungsverstärkung P102, P103, P106).
Für genauen Abgleich ist ein Servo-Analysator erforderlich. Jedoch besteht bei Normalbetrieb auch dann keine Schwierigkeit, wenn eine geringe Abweichung von den zulässigen Werten auftritt, da die Verstärkung in einem gewissen Bereich varieren kann. Deswegen sollte dieser Abgleich nicht ausgeführt werden. Mit der Fokus- und Servoverstärkung werden Nachführeigenschaften des Abtasters bei mechanischen Erschütterungen und Stößen während des Betriebs beeinflußt.

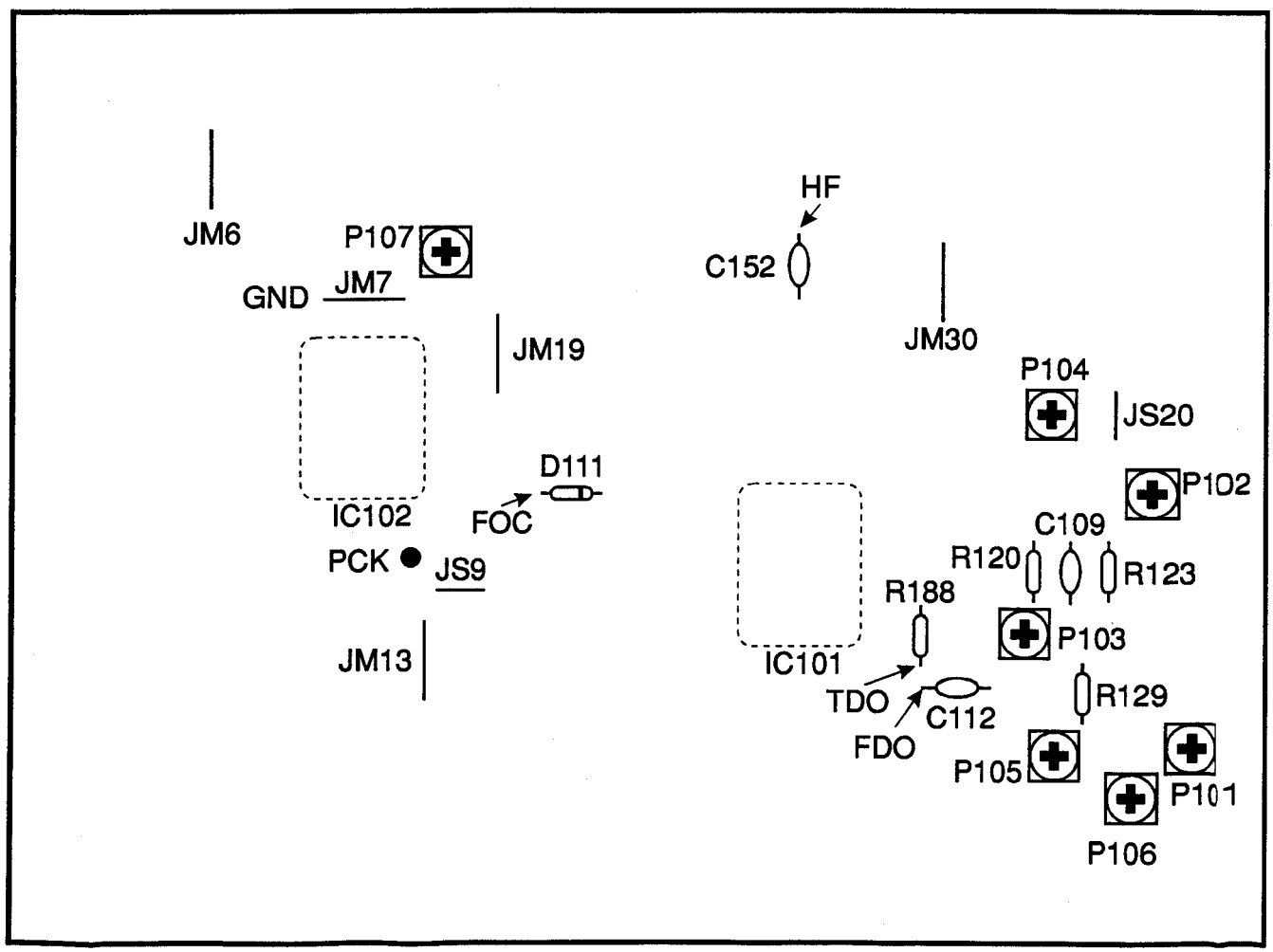
Focus servo gain adjustment
(Focus/Tracking-gain adjustment P102, P103, P104).
A servo-analyzer is required for accurate adjustment. However, there will be no problem in normal operation even in case of a minor drift from precise adjustment because the gain has an allowable margin.
Therefore, do not apply this adjustment.
The Focus/Tracking-gain determines the tracking property of the pick-up against the mechanical noise and mechanical shock during the operation.

Antriebstellerhöhe
Diese Einstellung ist notwendig, wenn der Antriebstellermotor gewechselt wird.
Der Antriebsteller muß so befestigt werden, daß der Abstand zwischen Oberkante Teller und Chassis 14,05 mm ±0,1 mm beträgt.

Adjustment of turntable height
This adjustment must be performed when the spindle motor is replaced.
The turntable should be mounted so that its upper surface is 14.05 mm ±0.1 mm above the surface of the chassis.



Abgleichpunkte
Alignment location



Ersatzteilliste CD (neue Platine) elektrisch
Spare parts list CD (new PCB) electrical

Best.-Nr. Part No.	Bezeichnung	Description	Pos.	Preisguppe Price-key
57 001 00	Grundplatine CD	CD decoder board		F1
57 459 00	CD-Display-Platine	CD display board	89	E 5
57 460 00	Grundplatine Gerät (neue CD Platine)	Main board assembly (new CD PCB)	57	F 8
57 002 00	IC LA 9210 M	IC LA 9210 M	IC 101	C2
48 408 00	IC LC 7860 K	IC LC 7860 K	IC 102	D9
65 361 00	IC LC 3517 BS	IC LC 3517 BS	IC 103	C5
60 970 00	IC LC 7881	IC LC 7881	IC 104	B9
24 151 00	IC LA 6458 S	IC LA 6458 S	IC 105	A9
57 003 00	IC LA 6531	IC LA 6531	IC 106	B5
57 003 00	IC LA 6531	IC LA 6531	IC 107	B5
08 012 00	Transistor 2 SC 1317	Transistor 2 SC 1317	Q 101, 102	A7
57 004 00	Transistor 2 SC 3330 R	Transistor 2 SC 3330 R	Q 106, 107	A1
40 367 00	Transistor 2 SA 1346	Transistor 2 SA 1346	Q 108	A2
57 005 00	Transistor 2 SC 3860	Transistor 2 SC 3860	Q 109	A1
60 366 00	Diode GMAO1-AT1-M	Diode GMAO1-AT1-M	D 103-111	A2
60 980 00	Keramik Schwingkreis CST 8,64 MG	CST 8.64 MG	X 101	A6
66 313 00	Trimmpoti 100 K	Semi-fixed resistor 100 K	P 101	A3
37 442 00	Trimmpoti 10 K	Semi-fixed resistor 10 K	P 102	A2
66 313 00	Trimmpoti 100 K	Semi-fixed resistor 100 K	P 103	A3
37 442 00	Trimmpoti 10 K	Semi-fixed resistor 10 K	P 104	A2
66 313 00	Trimmpoti 100 K	Semi-fixed resistor 100 K	P 105	A3
32 587 00	Trimmpoti 22 K	Semi-fixed resistor 22 K	P 106	A4
57 006 00	Trimmpoti 470 K	Semi-fixed resistor 470 K	P 107	A2
57 451 00	Frontblende Dual Cassette/Verstärker	Main escut	1 (für 68797)	C 3
57 437 00	Dual-Emblem	Name plate	6 (für 68797)	A 2
57 436 00	Einlage Dual Beschriftung FB-Geber	Remote key knob plate	FB-Geber (für 68797)	A 5

Bitte bei Ersatzteilbestellung die genaue Bezeichnung und **Ident-Nr. (siehe Typenschild)** des Gerätes sowie Bestell-Nummer und Positions-Nummer des Ersatzteils angeben.

For ordering of spare parts please state exact description and **ident.-no. of unit (see silver rating label on the backside of unit)** as well as part no. and position no. of required spare parts.

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Der Umwelt zuliebe!

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